



2" HARPER STYLE VANEMAKER SET-UP MANUAL



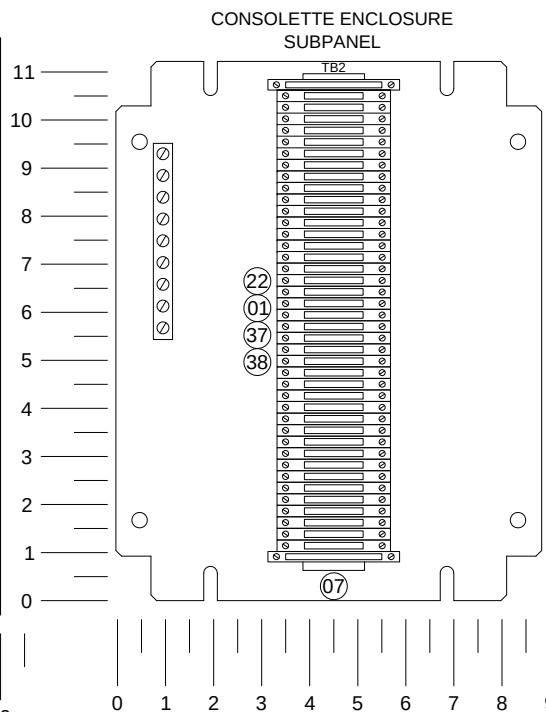
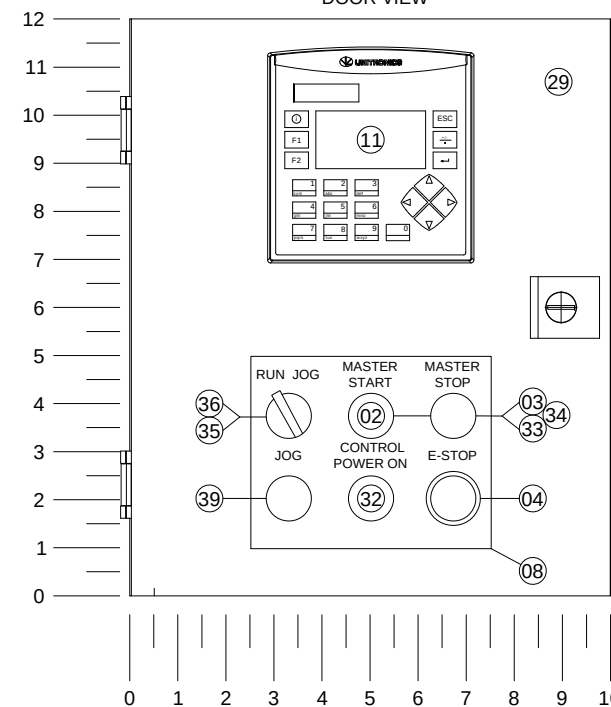
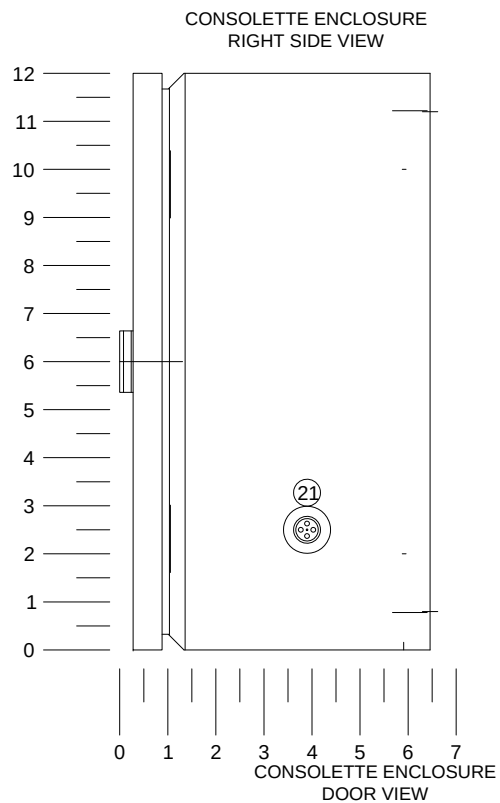
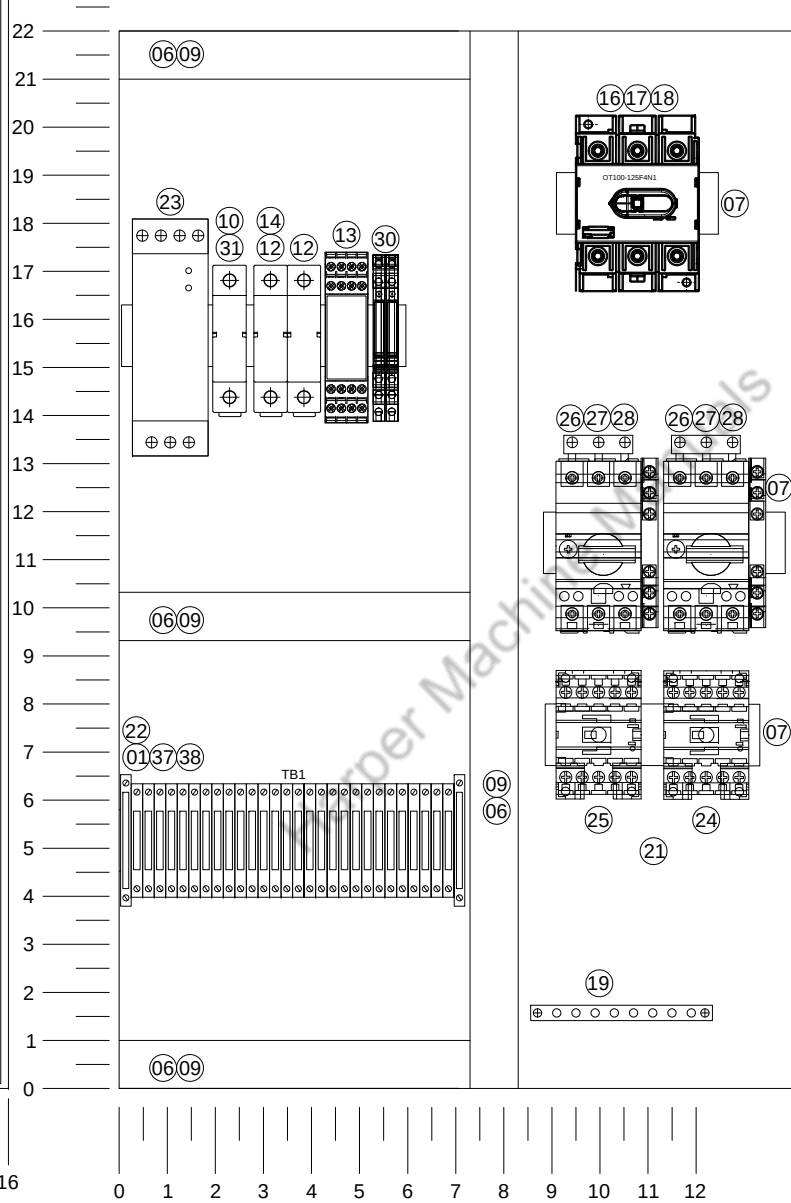
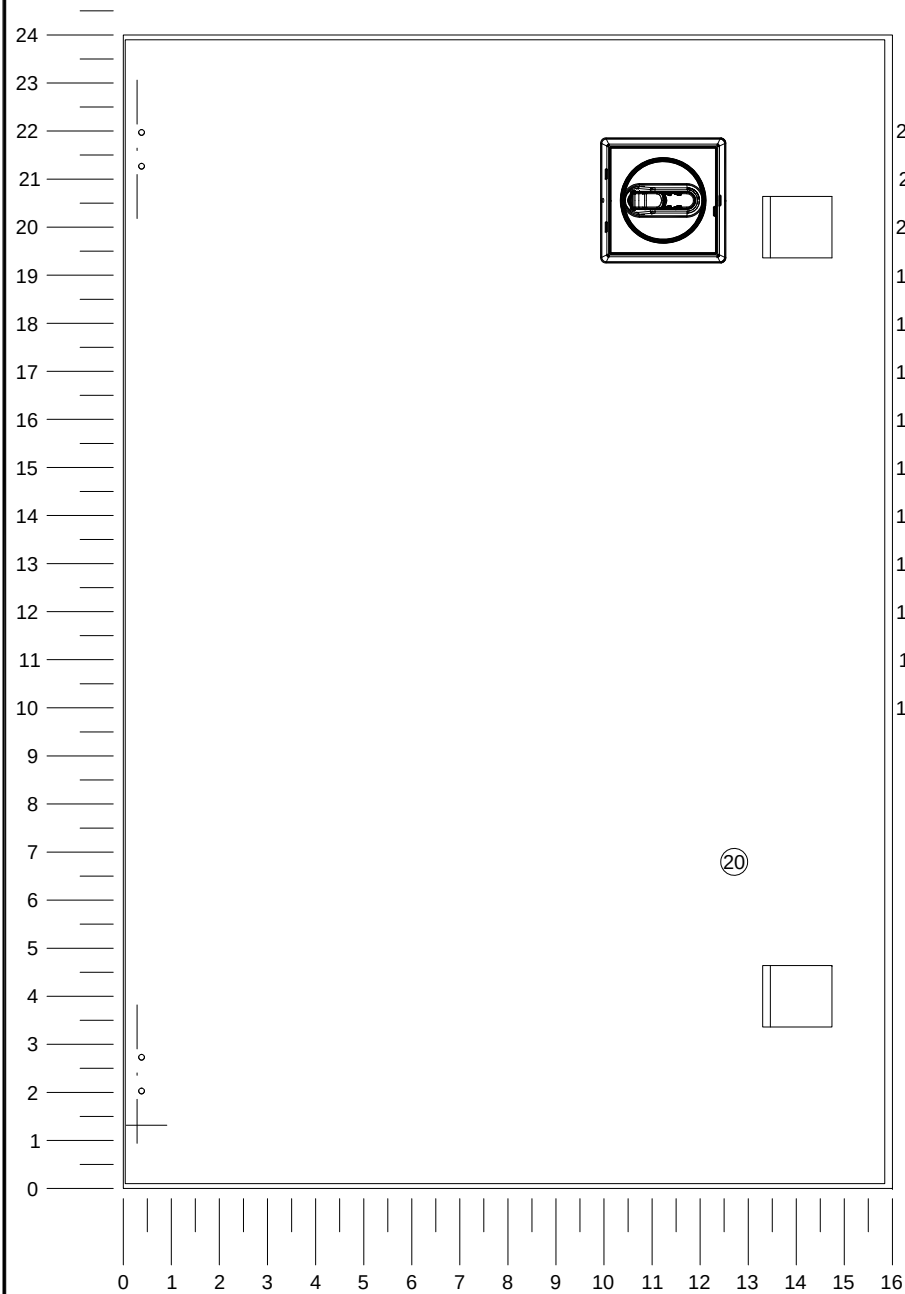
2" HARPER STYLE VANEMAKER

SET-UP MANUAL

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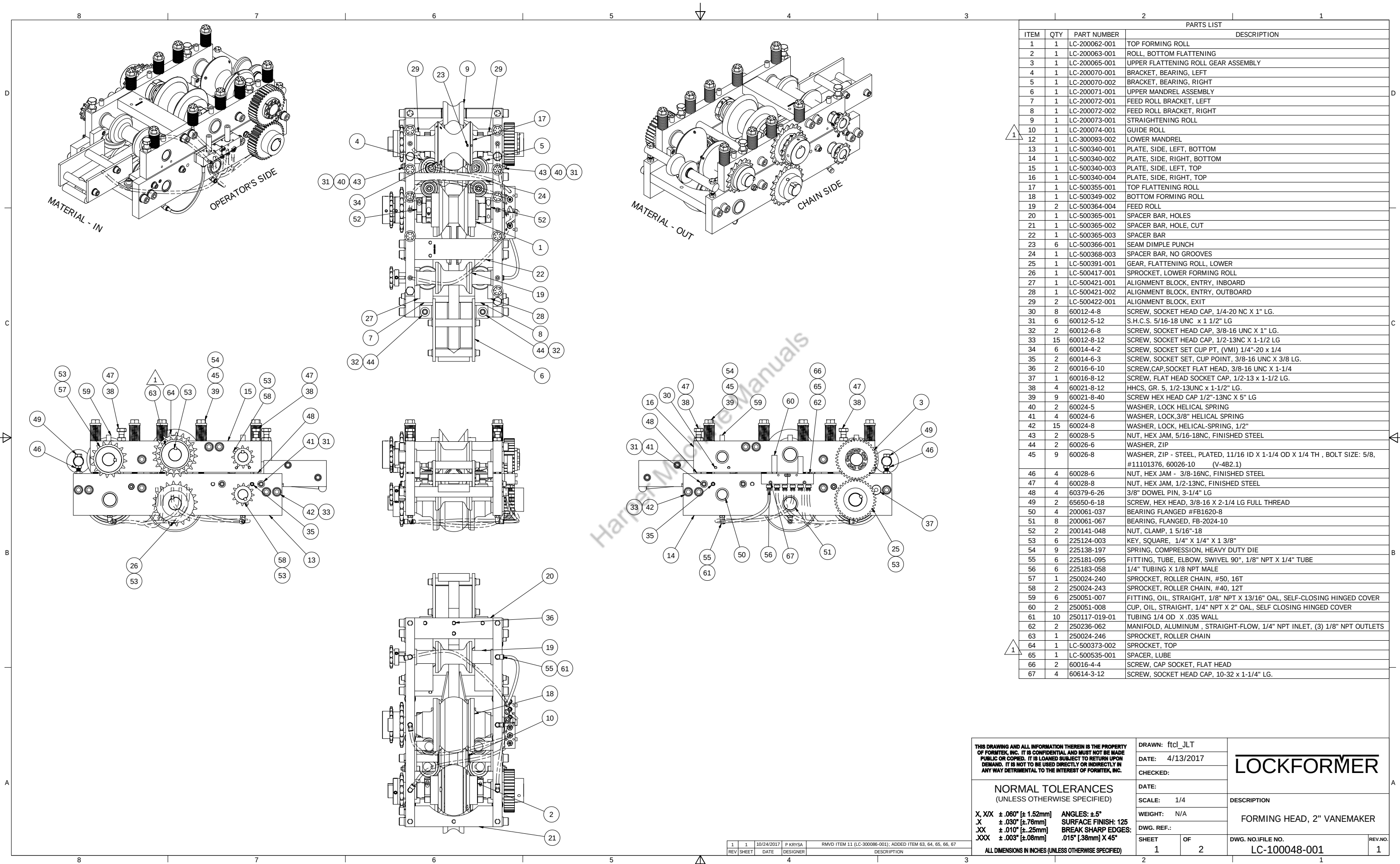
Page 1-4.....	Electrical Drawings
Page 5-25.....	Mechanical Drawings
Page 26-50.....	Bill of Materials
Page 51-55.....	Set-Up Manual





DO NOT SCALE DRAWING

				THIS DRAWING AND ALL INFORMATION THEREIN IS THE PROPERTY OF FORMTEK METAL FORMING, INC. IT IS CONFIDENTIAL AND MUST NOT BE MADE PUBLIC OR COPIED. IT IS LOANED SUBJECT TO RETURN UPON DEMAND. IT IS NOT TO BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF FORMTEK METAL FORMING, INC.				DRAWN: RDW DATE: 1/3/2018 CHECKED: XXX DATE: XX/XX/XX SCALE: X = 1'-0" PLOT SCALE: 1 = X DWG. REF.: LC-700016-0231 SHEET 3 OF 4				LOCKFORMER ASSEMBLY DRAWING LC-700016-231				REV. NO. 0	
				NORMAL TOLERANCES (UNLESS OTHERWISE SPECIFIED) X, X/X ±.060" [±1.52mm] ANGLES: ±5° .X ±.030" [±.76mm] SURFACE FINISH: 125/ .XX ±.015" [±.38mm] BREAK SHARP EDGES: .XXX ±.003" [±.08mm] .015" [.38mm] X 45°													
				ALL DIMENSIONS IN INCHES (UNLESS OTHERWISE SPECIFIED)													



		PARTS LIST		1
ITEM	QTY	PART NUMBER	DESCRIPTION	
1	1	LC-200062-001	TOP FORMING ROLL	
2	1	LC-200063-001	ROLL, BOTTOM FLATTENING	
3	1	LC-200065-001	UPPER FLATTENING ROLL GEAR ASSEMBLY	
4	1	LC-200070-001	BRACKET, BEARING, LEFT	
5	1	LC-200070-002	BRACKET, BEARING, RIGHT	
6	1	LC-200071-001	UPPER MANDREL ASSEMBLY	
7	1	LC-200072-001	FEED ROLL BRACKET, LEFT	
8	1	LC-200072-002	FEED ROLL BRACKET, RIGHT	
9	1	LC-200073-001	STRAIGHTENING ROLL	
10	1	LC-200074-001	GUIDE ROLL	
12	1	LC-300093-002	LOWER MANDREL	
13	1	LC-500340-001	PLATE, SIDE, LEFT, BOTTOM	
14	1	LC-500340-002	PLATE, SIDE, RIGHT, BOTTOM	
15	1	LC-500340-003	PLATE, SIDE, LEFT, TOP	
16	1	LC-500340-004	PLATE, SIDE, RIGHT, TOP	
17	1	LC-500355-001	TOP FLATTENING ROLL	
18	1	LC-500349-002	BOTTOM FORMING ROLL	
19	2	LC-500364-004	FEED ROLL	
20	1	LC-500365-001	SPACER BAR, HOLES	
21	1	LC-500365-002	SPACER BAR, HOLE, CUT	
22	1	LC-500365-003	SPACER BAR	
23	6	LC-500366-001	SEAM DIMPLE PUNCH	
24	1	LC-500368-003	SPACER BAR, NO GROOVES	
25	1	LC-500391-001	GEAR, FLATTENING ROLL, LOWER	
26	1	LC-500417-001	SPROCKET, LOWER FORMING ROLL	
27	1	LC-500421-001	ALIGNMENT BLOCK, ENTRY, INBOARD	
28	1	LC-500421-002	ALIGNMENT BLOCK, ENTRY, OUTBOARD	
29	2	LC-500422-001	ALIGNMENT BLOCK, EXIT	
30	8	60012-4-8	SCREW, SOCKET HEAD CAP, 1/4-20 NC X 1" LG.	
31	6	60012-5-12	S.H.C.S. 5/16-18 UNC x 1 1/2" LG	
32	2	60012-6-8	SCREW, SOCKET HEAD CAP, 3/8-16 UNC X 1" LG.	
33	15	60012-8-12	SCREW, SOCKET HEAD CAP, 1/2-13NC X 1-1/2 LG	
34	6	60014-4-2	SCREW, SOCKET SET CUP PT, (VMI) 1/4"-20 x 1/4	
35	2	60014-6-3	SCREW, SOCKET SET, CUP POINT, 3/8-16 UNC X 3/8 LG.	
36	2	60016-6-10	SCREW,CAP,SOCKET FLAT HEAD, 3/8-16 UNC X 1-1/4	
37	1	60016-8-12	SCREW, FLAT HEAD SOCKET CAP, 1/2-13 x 1-1/2 LG.	
38	4	60021-8-12	HHCS, GR. 5, 1/2-13UNC x 1-1/2" LG.	
39	9	60021-8-40	SCREW HEX HEAD CAP 1/2"-13NC X 5" LG	
40	2	60024-5	WASHER, LOCK HELICAL SPRING	
41	4	60024-6	WASHER, LOCK,3/8" HELICAL SPRING	
42	15	60024-8	WASHER, LOCK, HELICAL-SPRING, 1/2"	
43	2	60028-5	NUT, HEX JAM, 5/16-18NC, FINISHED STEEL	
44	2	60026-6	WASHER, ZIP	
45	9	60026-8	WASHER, ZIP - STEEL, PLATED, 11/16 ID X 1-1/4 OD X 1/4 TH , BOLT SIZE: 5/8, #11101376, 60026-10 (V-4B2.1)	
46	4	60028-6	NUT, HEX JAM - 3/8-16NC, FINISHED STEEL	
47	4	60028-8	NUT, HEX JAM, 1/2-13NC, FINISHED STEEL	
48	4	60379-6-26	3/8" DOWEL PIN, 3-1/4" LG	
49	2	65650-6-18	SCREW, HEX HEAD, 3/8-16 X 2-1/4 LG FULL THREAD	
50	4	200061-037	BEARING FLANGED #FB1620-8	
51	8	200061-067	BEARING, FLANGED, FB-2024-10	
52	2	200141-048	NUT, CLAMP, 1 5/16"-18	
53	6	225124-003	KEY, SQUARE, 1/4" X 1/4" X 1 3/8"	
54	9	225138-197	SPRING, COMPRESSION, HEAVY DUTY DIE	
55	6	225181-095	FITTING, TUBE, ELBOW, SWIVEL 90°, 1/8" NPT X 1/4" TUBE	
56	6	225183-058	1/4" TUBING X 1/8 NPT MALE	
57	1	250024-240	SPROCKET, ROLLER CHAIN, #50, 16T	
58	2	250024-243	SPROCKET, ROLLER CHAIN, #40, 12T	
59	6	250051-007	FITTING, OIL, STRAIGHT, 1/8" NPT X 13/16" OAL, SELF-CLOSING HINGED COVER	
60	2	250051-008	CUP, OIL, STRAIGHT, 1/4" NPT X 2" OAL, SELF CLOSING HINGED COVER	
61	10	250117-019-01	TUBING 1/4 OD X .035 WALL	
62	2	250236-062	MANIFOLD, ALUMINUM , STRAIGHT-FLOW, 1/4" NPT INLET, (3) 1/8" NPT OUTLETS	
63	1	250024-246	SPROCKET, ROLLER CHAIN	
64	1	LC-500373-002	SPROCKET, TOP	
65	1	LC-500535-001	SPACER, LUBE	
66	2	60016-4-4	SCREW, CAP SOCKET, FLAT HEAD	
67	4	60614-3-12	SCREW, SOCKET HEAD CAP, 10-32 x 1-1/4" LG.	

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NORMAL TOLERANCES
(UNLESS OTHERWISE SPECIFIED)

X, X/X ± .080" [± 1.52mm]
.X ± .030" [±.76mm]
.XX ± .010" [±.25mm]
.XXX ± .003" [±.08mm]

ANGLES: ±.5°
SURFACE FINISH: 125
BREAK SHARP EDGES:
.015" [.38mm] X 45°

ALL DIMENSIONS IN INCHES (UNLESS OTHERWISE SPECIFIED)

DRAWN: ftcl_jLT
DATE: 4/13/2017
CHECKED:
DATE:
SCALE: 1/4
WEIGHT: N/A
DWG. REF.:
SHEET 1 OF 2

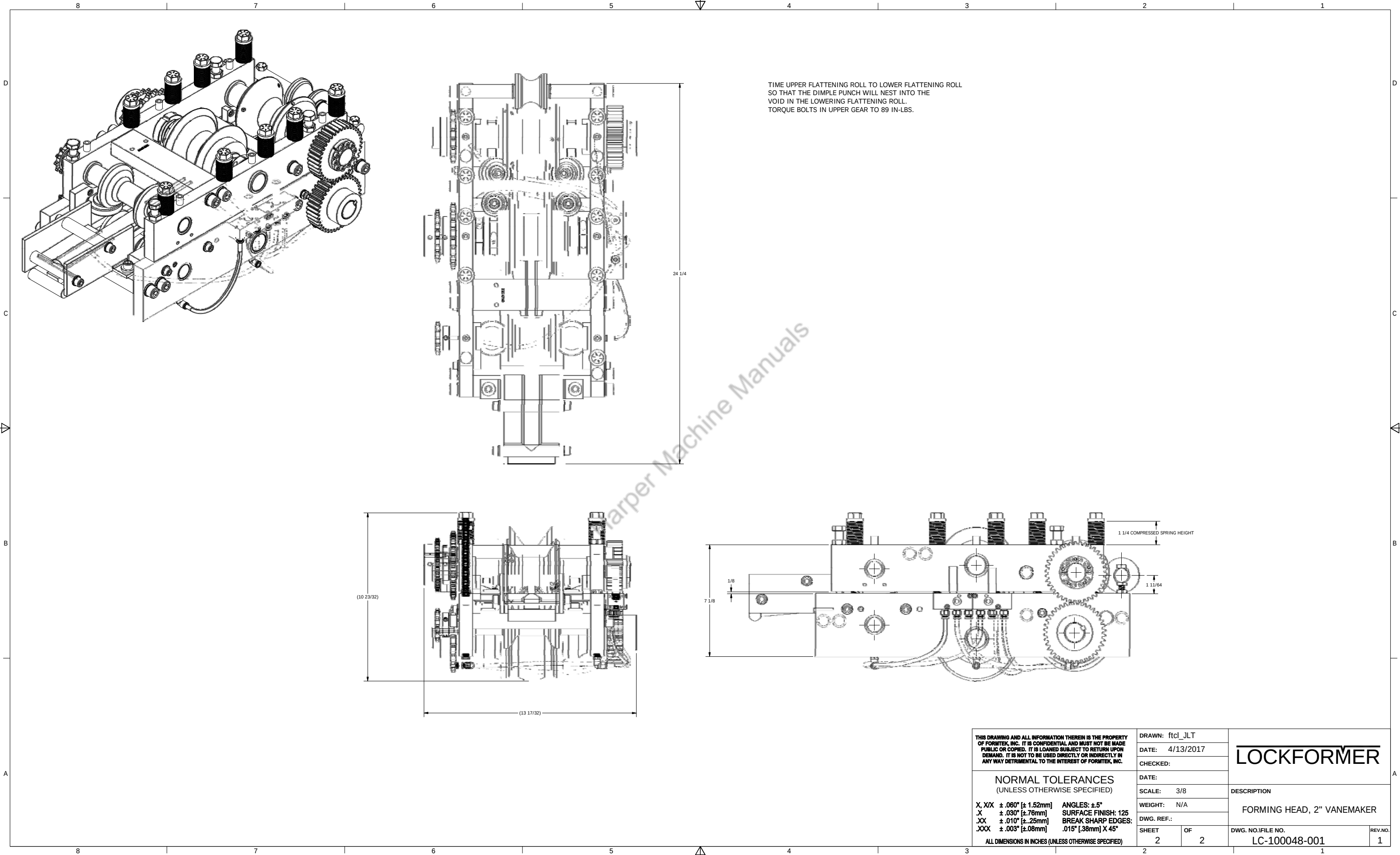
LOCKFORMER

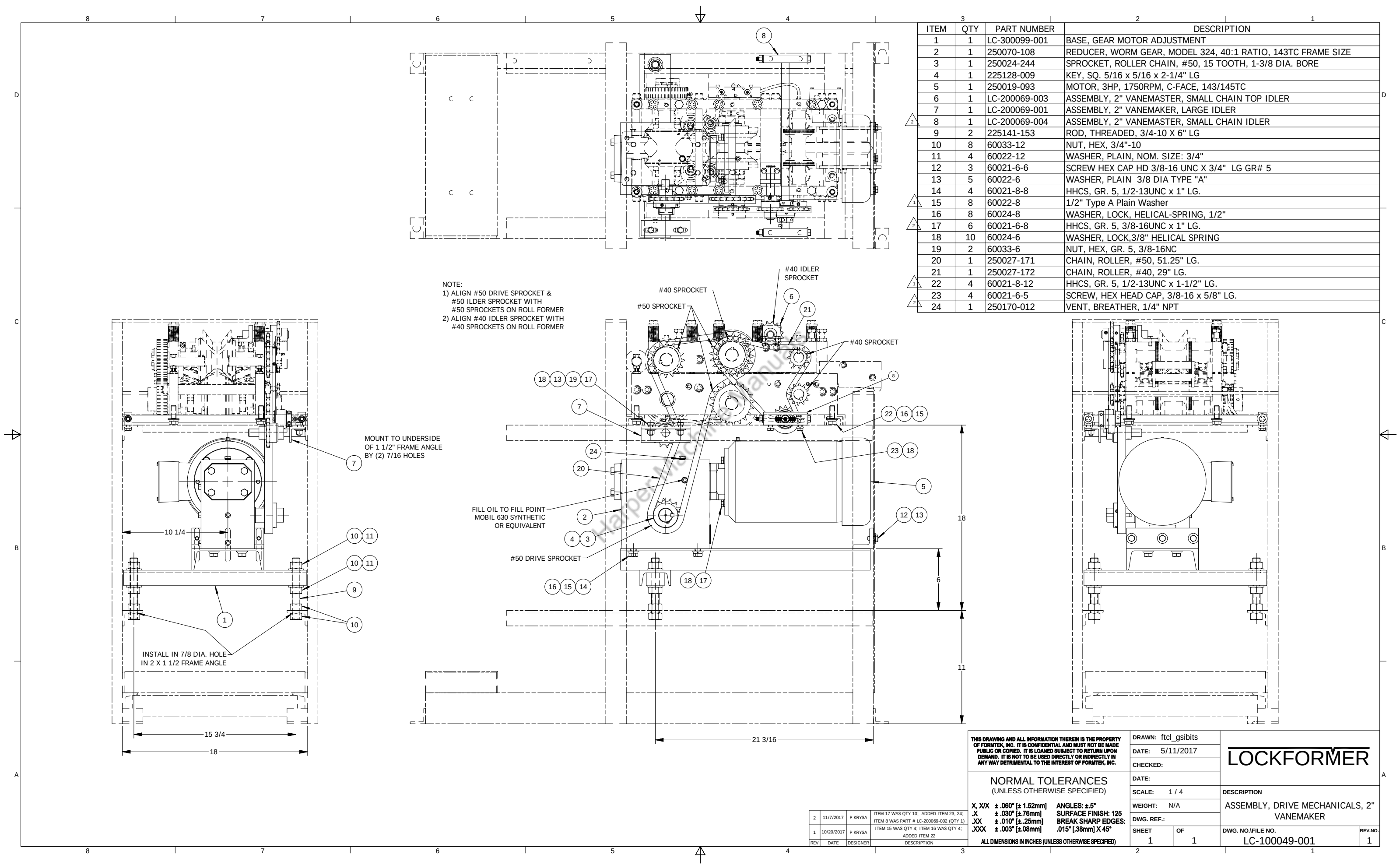
DESCRIPTION
FORMING HEAD, 2" VANEMAKER

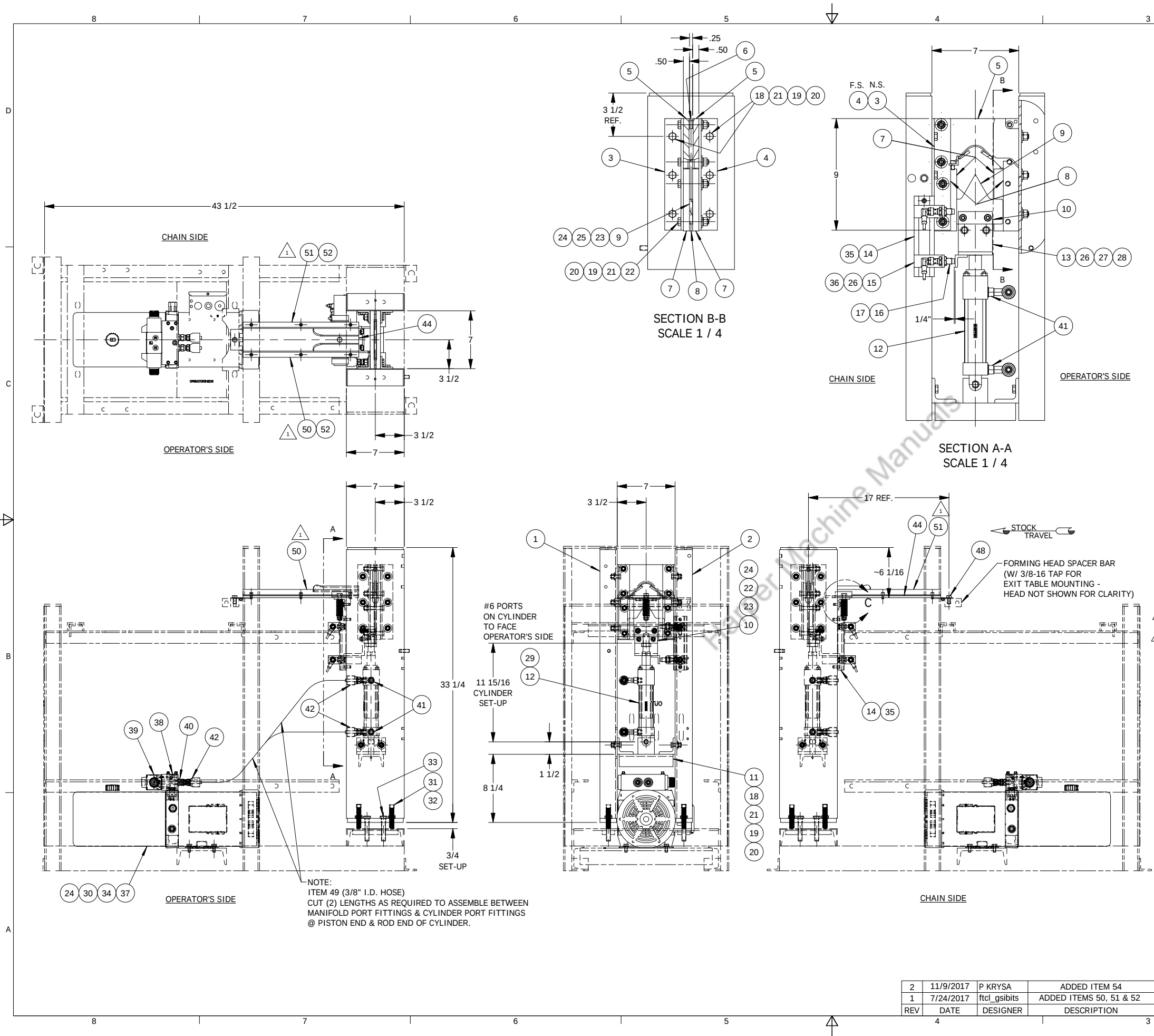
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LC-100048-001

REV.NO.
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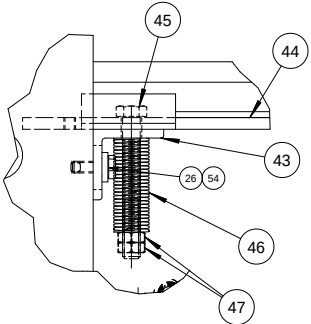
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REV	SHEET	DATE	DESIGNER	DESCRIPTION







ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	LC-300101-004	CHANNEL, SHEAR UPRIGHT, OPERATOR'S SIDE
2	1	LC-300101-003	CHANNEL, SHEAR UPRIGHT, CHAIN SIDE
3	2	LC-500412-001	ANGLE, SHEAR DIE MOUNT, RIGHT
4	2	LC-500412-002	ANGLE, SHEAR DIE MOUNT, LEFT
5	1 SET	LC-500407-001	SHEAR DIE
6	2	LC-500413-001	SPACER, SHEAR TOP
7	4	LC-500410-001	SHEAR BLADE GUSSET
8	2	LC-500409-001	SHEAR BLADE GUIDE
9	1	LC-500408-001	2" VANE SHEAR BLADE
10	1	LC-500411-001	BLADE HOLDER
11	1	LC-300103-001	BASE, SHEAR CYLINDER MOUNTING
12	1	200056-146	CYLINDER, HYDRAULIC, 1-1/2" DIA. X 4" STROKE, CLEVIS MOUNT
13	1	LC-300106-002	BRACKET, PROX TARGET
14	1	LC-500474-001	STRUT, PROX MOUNTING
15	2	LC-500475-001	BRACKET, PROX MOUNTING
16	2	250017-490	SWITCH, PROXIMITY, M12 X 1mm
17	2	250102-220	CABLE, M12, 90° CONNECTOR
18	16	60021-6-8	HHCS, GR. 5, 3/8-16UNC x 1" LG.
19	24	60022-6	WASHER, PLAIN 3/8 DIA TYPE "A"
20	24	60024-6	WASHER, LOCK, 3/8" HELICAL SPRING
21	24	60033-6	NUT, HEX, GR. 5, 3/8-16NC
22	8	60021-6-18	SCREW, HEX HEAD CAP, 3/8-16 X 2 1/4 LG
23	2	60016-5-16	SCREW, FLAT HEAD, 5/16-18 X 2" LG.
24	6	60024-5	WASHER, LOCK HELICAL SPRING
25	2	60033-5	NUT, HEX, 5/16-18 UNC
26	6	60021-4-6	SCREW, HEX HEAD CAP, 1/4-20NC X 3/4 LG
27	2	60022-4	Type A Plain Washer
28	2	60024-4	Helical Spring Lock Washer
29	1	60030-12	NUT, HEX JAM, 3/4-16, FINISHED STEEL
30	4	60022-5	WASHER PLAIN 5/16" DIA TYPE "A"
31	4	60006-8-20	SCREW, SQUARE HEAD SET CUP POINT, 1/2-13NC X 2-1/2 LG
32	4	60028-8	NUT, HEX JAM, 1/2-13NC, FINISHED STEEL
33	4	65650-8-22	SCREW, HEX HEAD, 1/2-13 X 2 3/4" LG., FULL THREAD
34	4	60021-5-6	HHCS, GR.5, 5/16-18UNC x 3/4 LG.
35	2	60012-4-5	SHCS 1/4-20 UNC x 5/8" LG.
36	2	60185-11	NUT, CLAMPING - W/SPRING 1/4-20NC
37	1	250224-046	HYDRAULIC POWER UNIT
38	1	250236-061	MANIFOLD, ADAPTER, D03
39	1	250209-091	VALVE, HYDAULIC, DIRECTIONAL, 4-WAY, 3 POS., 24V
40	2	250118-042	FITTING, MALE STRAIGHT, #6 SAE X #6 JIC MALE
41	2	250118-068	FITTING, 90° LONG ELBOW, #6 SAE O-RING X #6 M JIC
42	4	250118-105	HOSE END-FEMALE SWIVEL, #6 FE JIC X 3/8" HOSE
43	1	LC-300113-001	SUPPORT, EXIT TABLE
44	1	LC-300107-001	EXIT TABLE
45	1	60021-6-24	SCREW, HEX HEAD CAP, 3/8-16 X 3" LG
46	1	225138-170	SPRING, COMPRESSION, 3/4" H.D., 3/8 ROD, 2" FREE LTH.
47	2	60028-6	NUT, HEX JAM - 3/8-16NC, FINISHED STEEL
48	1	60021-6-6	SCREW HEX CAP HD 3/8-16 UNC X 3/4" LG GR# 5
50	1	LC-300115-001	GUIDE, EXIT TABLE VANE, OPERATOR'S SIDE
51	1	LC-300115-002	GUIDE, EXIT TABLE VANE, CHAIN SIDE
52	6	60012-4-4	SCREW, SOCKET HEAD CAP 1/4"-20UC X 1/2" LG.
54	2	60026-4	WASHER, ZIP, 1/4"



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NORMAL TOLERANCES
(UNLESS OTHERWISE SPECIFIED)

X, X/X ±.080" [± 1.52mm]
X ±.030" [±.76mm]
XX ±.010" [±.25mm]
XXX ±.003" [±.08mm]

ANGLES: ±5°
SURFACE FINISH: 125
BREAK SHARP EDGES:
.015" [.38mm] X 45°

ALL DIMENSIONS IN INCHES (UNLESS OTHERWISE SPECIFIED)

DRAWN: ftcl_gsibits

DATE: 5/30/2017

CHECKED:

DATE:

SCALE: 1 / 6

WEIGHT: N/A

DWG. REF.: LC-100050-001

SHEET 1

OF 1

LOCKFORMER

DESCRIPTION

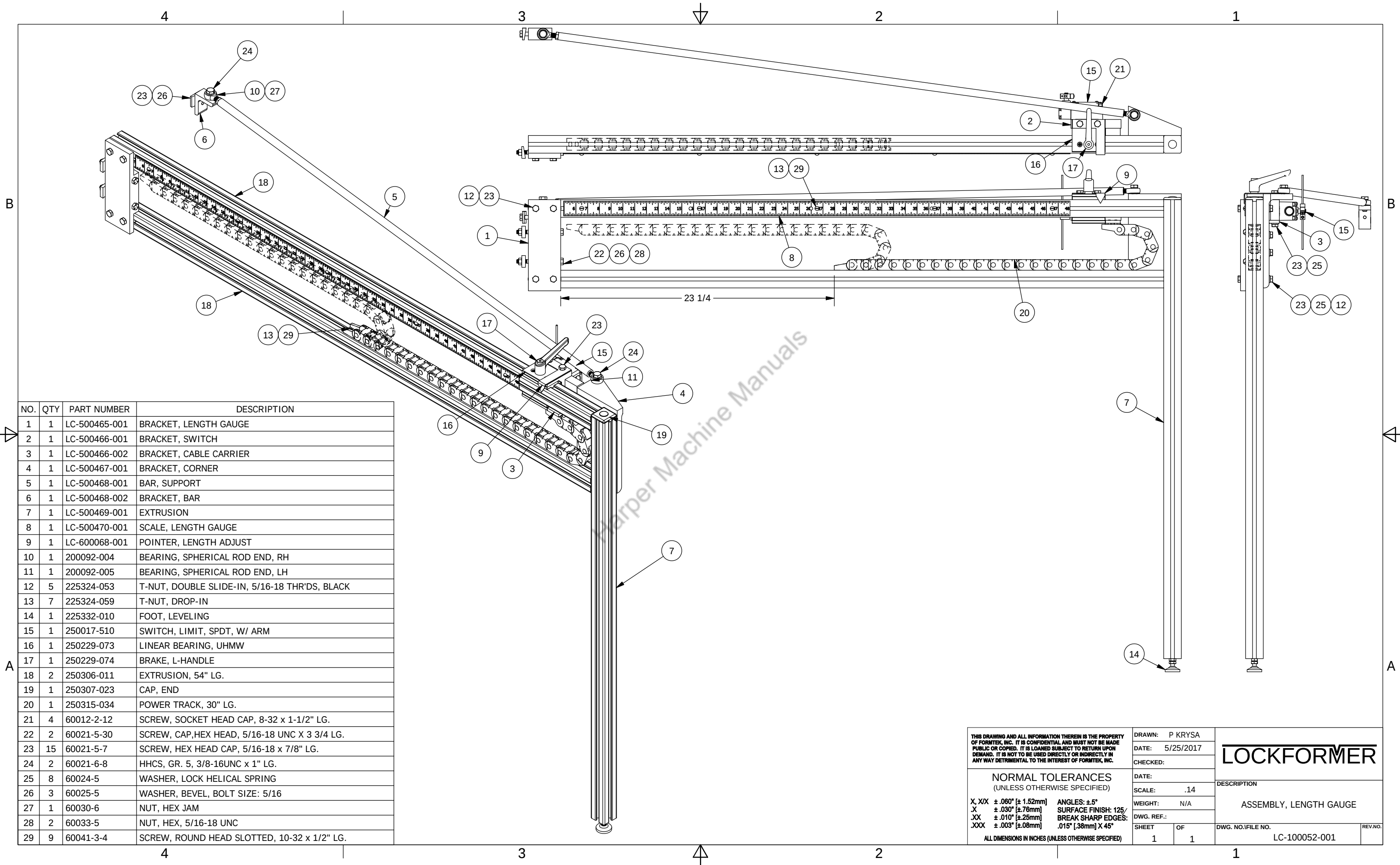
ASSEMBLY, 2" VANEMAKER SHEAR

DWG. NO./FILE NO.

LC-100050-002

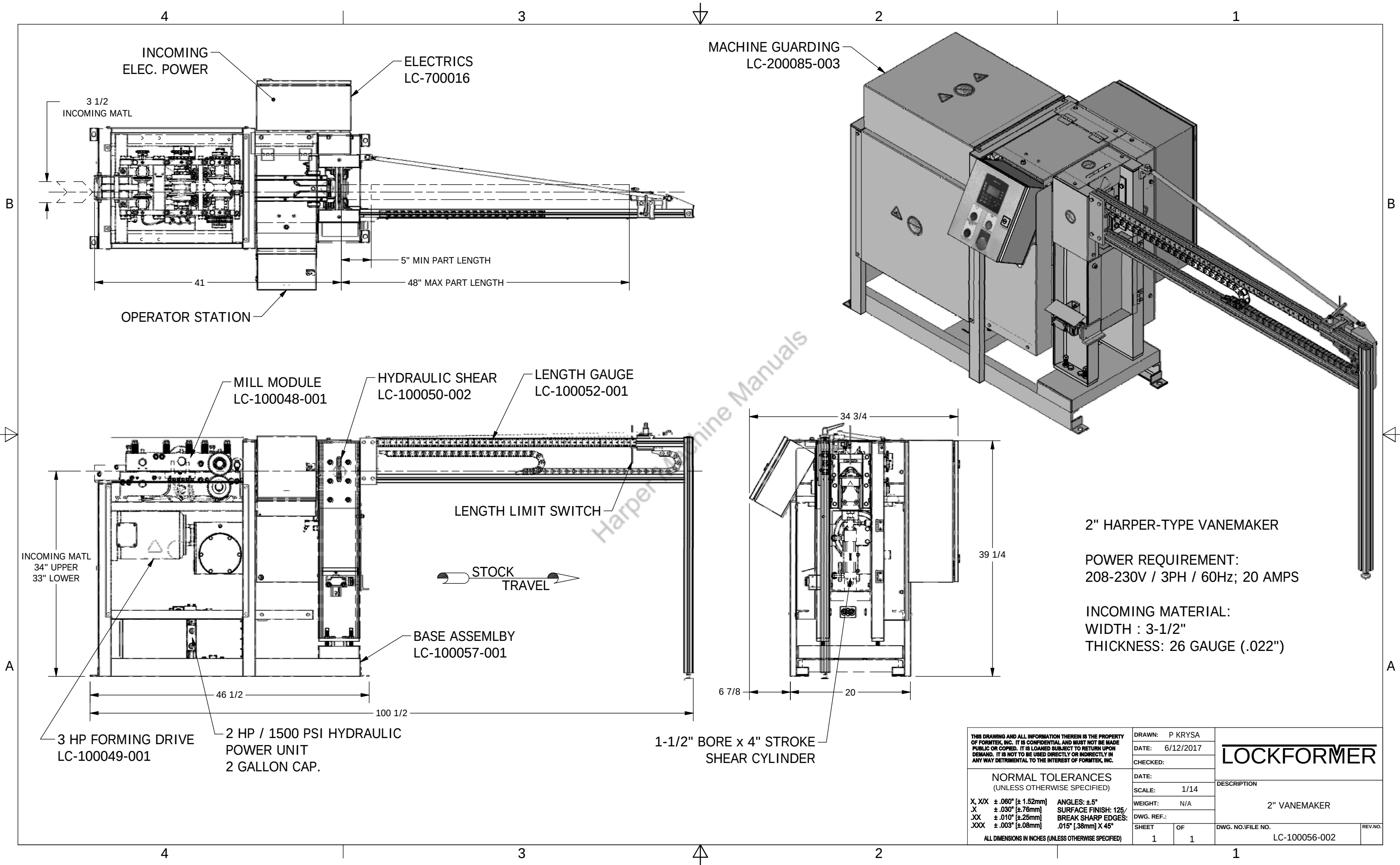
REV. NO.

2



NO.	QTY	PART NUMBER	DESCRIPTION
1	1	LC-500465-001	BRACKET, LENGTH GAUGE
2	1	LC-500466-001	BRACKET, SWITCH
3	1	LC-500466-002	BRACKET, CABLE CARRIER
4	1	LC-500467-001	BRACKET, CORNER
5	1	LC-500468-001	BAR, SUPPORT
6	1	LC-500468-002	BRACKET, BAR
7	1	LC-500469-001	EXTRUSION
8	1	LC-500470-001	SCALE, LENGTH GAUGE
9	1	LC-600068-001	POINTER, LENGTH ADJUST
10	1	200092-004	BEARING, SPHERICAL ROD END, RH
11	1	200092-005	BEARING, SPHERICAL ROD END, LH
12	5	225324-053	T-NUT, DOUBLE SLIDE-IN, 5/16-18 THR'DS, BLACK
13	7	225324-059	T-NUT, DROP-IN
14	1	225332-010	FOOT, LEVELING
15	1	250017-510	SWITCH, LIMIT, SPDT, W/ ARM
16	1	250229-073	LINEAR BEARING, UHMW
17	1	250229-074	BRAKE, L-HANDLE
18	2	250306-011	EXTRUSION, 54" LG.
19	1	250307-023	CAP, END
20	1	250315-034	POWER TRACK, 30" LG.
21	4	60012-2-12	SCREW, SOCKET HEAD CAP, 8-32 x 1-1/2" LG.
22	2	60021-5-30	SCREW, CAP,HEX HEAD, 5/16-18 UNC X 3 3/4 LG.
23	15	60021-5-7	SCREW, HEX HEAD CAP, 5/16-18 x 7/8" LG.
24	2	60021-6-8	HHCS, GR. 5, 3/8-16UNC x 1" LG.
25	8	60024-5	WASHER, LOCK HELICAL SPRING
26	3	60025-5	WASHER, BEVEL, BOLT SIZE: 5/16
27	1	60030-6	NUT, HEX JAM
28	2	60033-5	NUT, HEX, 5/16-18 UNC
29	9	60041-3-4	SCREW, ROUND HEAD SLOTTED, 10-32 x 1/2" LG.

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	DATE: 5/25/2017			
	CHECKED:			
	DATE:			
NORMAL TOLERANCES (UNLESS OTHERWISE SPECIFIED) X, X/X ± .060" [± 1.52mm] ANGLES: ± 5° .X ± .030" [± .76mm] SURFACE FINISH: 125/ .XX ± .010" [± .25mm] BREAK SHARP EDGES: .XXX ± .003" [± .08mm] .015" [.38mm] X 45° ALL DIMENSIONS IN INCHES (UNLESS OTHERWISE SPECIFIED)	SCALE: .14			
	WEIGHT: N/A			
	DWG. REF.:			
	SHEET 1		OF 1	

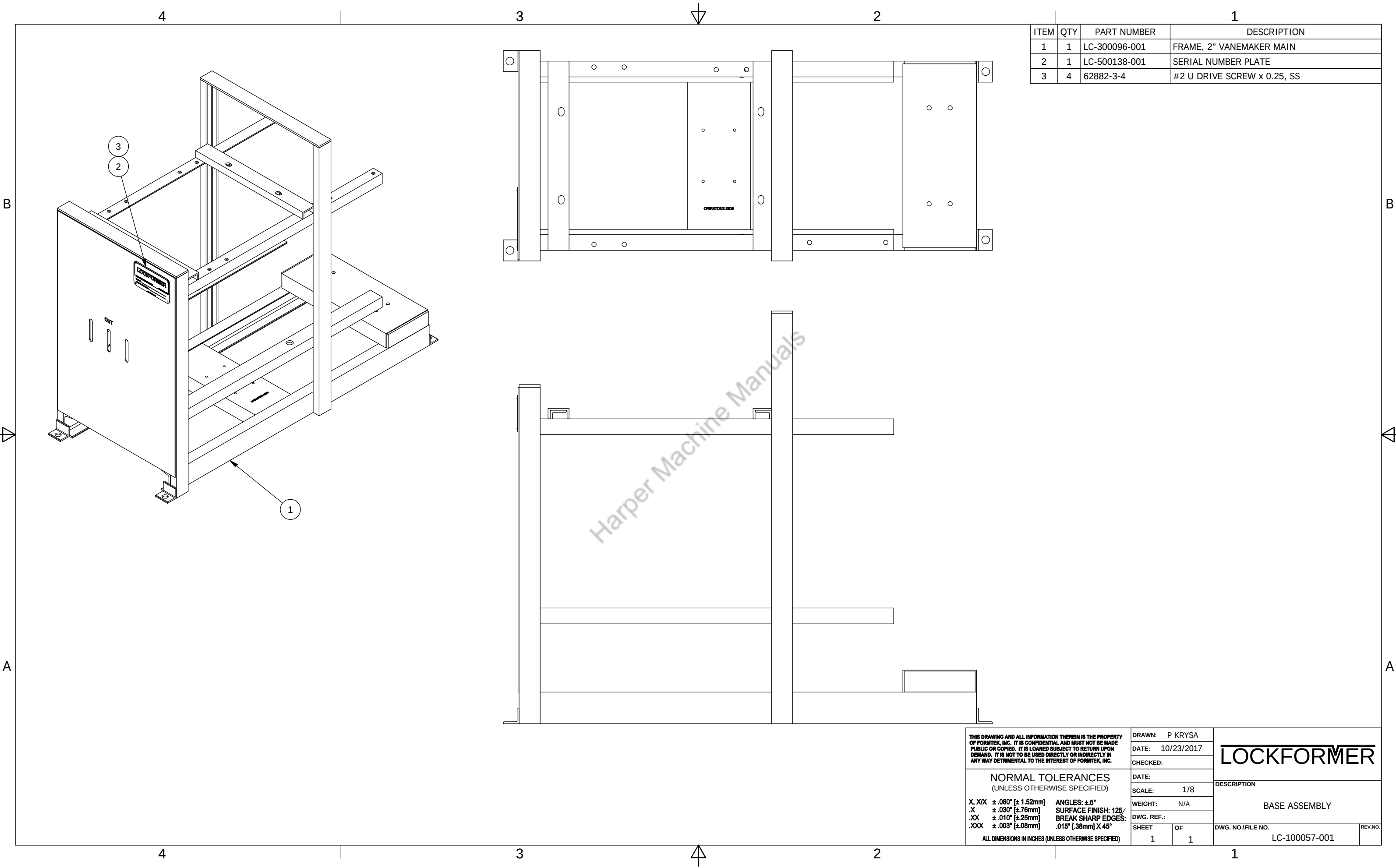


2" HARPER-TYPE VANEMAKER

POWER REQUIREMENT:
208-230V / 3PH / 60Hz; 20 AMPS

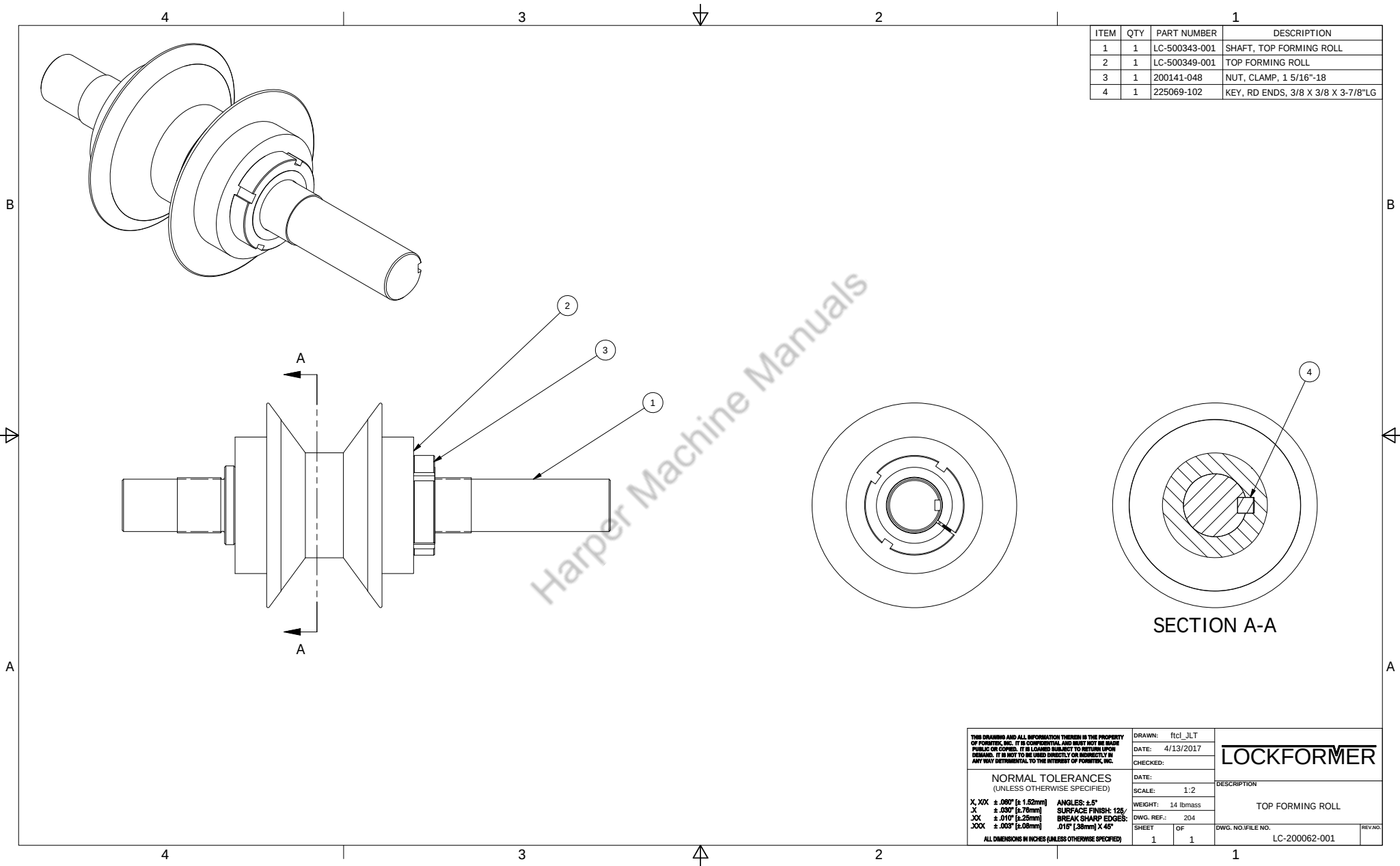
INCOMING MATERIAL:
WIDTH : 3-1/2"
THICKNESS: 26 GAUGE (.022")

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		DATE: 6/12/2017							
		CHECKED:							
		DATE:							
NORMAL TOLERANCES (UNLESS OTHERWISE SPECIFIED) X, X/X ± .060" [± 1.52mm] ANGLES: ±5° .X ± .030" [± .76mm] SURFACE FINISH: 125/ .XX ± .010" [± .25mm] BREAK SHARP EDGES: .XXX ± .003" [± .08mm] .015" [.38mm] X 45° ALL DIMENSIONS IN INCHES (UNLESS OTHERWISE SPECIFIED)		SCALE: 1/14		DESCRIPTION					
		WEIGHT: N/A							
		DWG. REF.:							
		SHEET 1		OF 1		DWG. NO./FILE NO. LC-100056-002		REV.NO.	



ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	LC-300096-001	FRAME, 2" VANEMAKER MAIN
2	1	LC-500138-001	SERIAL NUMBER PLATE
3	4	62882-3-4	#2 U DRIVE SCREW x 0.25, SS

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			DATE: 10/23/2017			
			CHECKED:		DESCRIPTION	
			DATE:			
NORMAL TOLERANCES (UNLESS OTHERWISE SPECIFIED) X, X/X ± .060" [± 1.52mm] ANGLES: ±5° .X ± .030" [±.76mm] SURFACE FINISH: 125/ .XX ± .010" [±.25mm] BREAK SHARP EDGES: .XXX ± .003" [±.08mm] .015" [.38mm] X 45° ALL DIMENSIONS IN INCHES (UNLESS OTHERWISE SPECIFIED)		SCALE: 1/8				
		WEIGHT: N/A				
		DWG. REF.:				
SHEET 1		OF 1	DWG. NO. LC-100057-001		REV.NO.	



ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	LC-500343-001	SHAFT, TOP FORMING ROLL
2	1	LC-500349-001	TOP FORMING ROLL
3	1	200141-048	NUT, CLAMP, 1 5/16"-18
4	1	225069-102	KEY, RD ENDS, 3/8 X 3/8 X 3-7/8"LG

SECTION A-A

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NORMAL TOLERANCES
(UNLESS OTHERWISE SPECIFIED)

X, XX ± .000" [± 1.52mm]	ANGLES: ± 5°
X ± .000" [± .76mm]	SURFACE FINISH: 125
XX ± .010" [± .25mm]	BREAK SHARP EDGES:
XXX ± .003" [± .08mm]	.015" [.38mm] X 45°

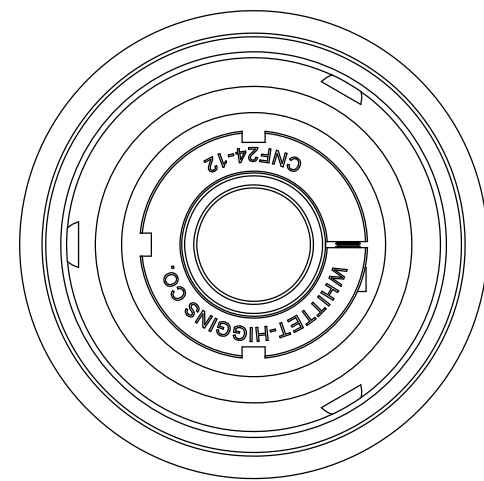
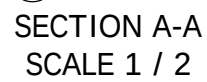
ALL DIMENSIONS IN INCHES (UNLESS OTHERWISE SPECIFIED)

DRAWN: ftcl_JLT
DATE: 4/13/2017
CHECKED:
DATE:
SCALE: 1:2
WEIGHT: 14 lbmass
DWG. REF.: 204
SHEET 1 OF 1

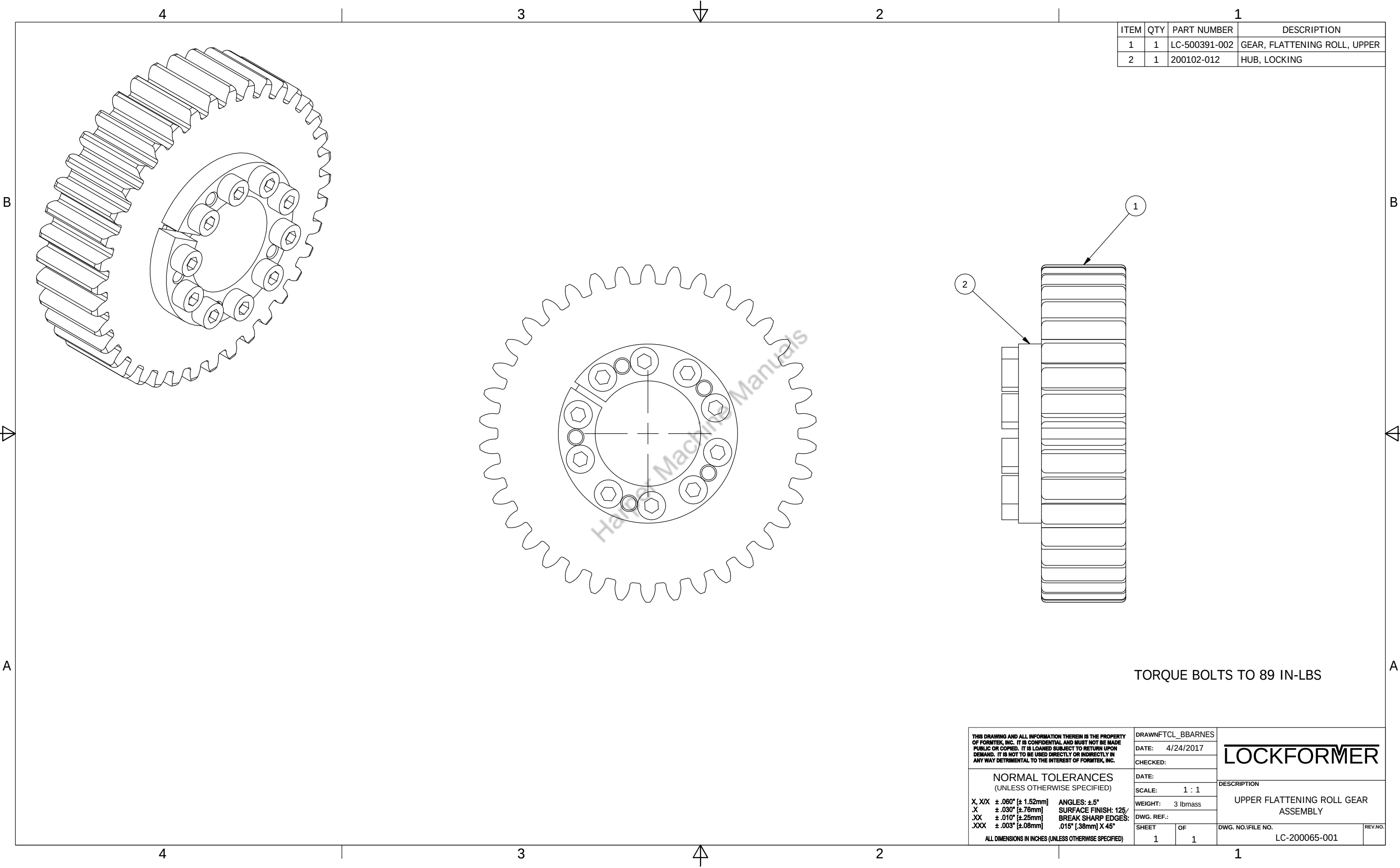
LOCKFORMER

DESCRIPTION
TOP FORMING ROLL

DWG. NO./FILE NO. LC-200062-001
REV. NO.

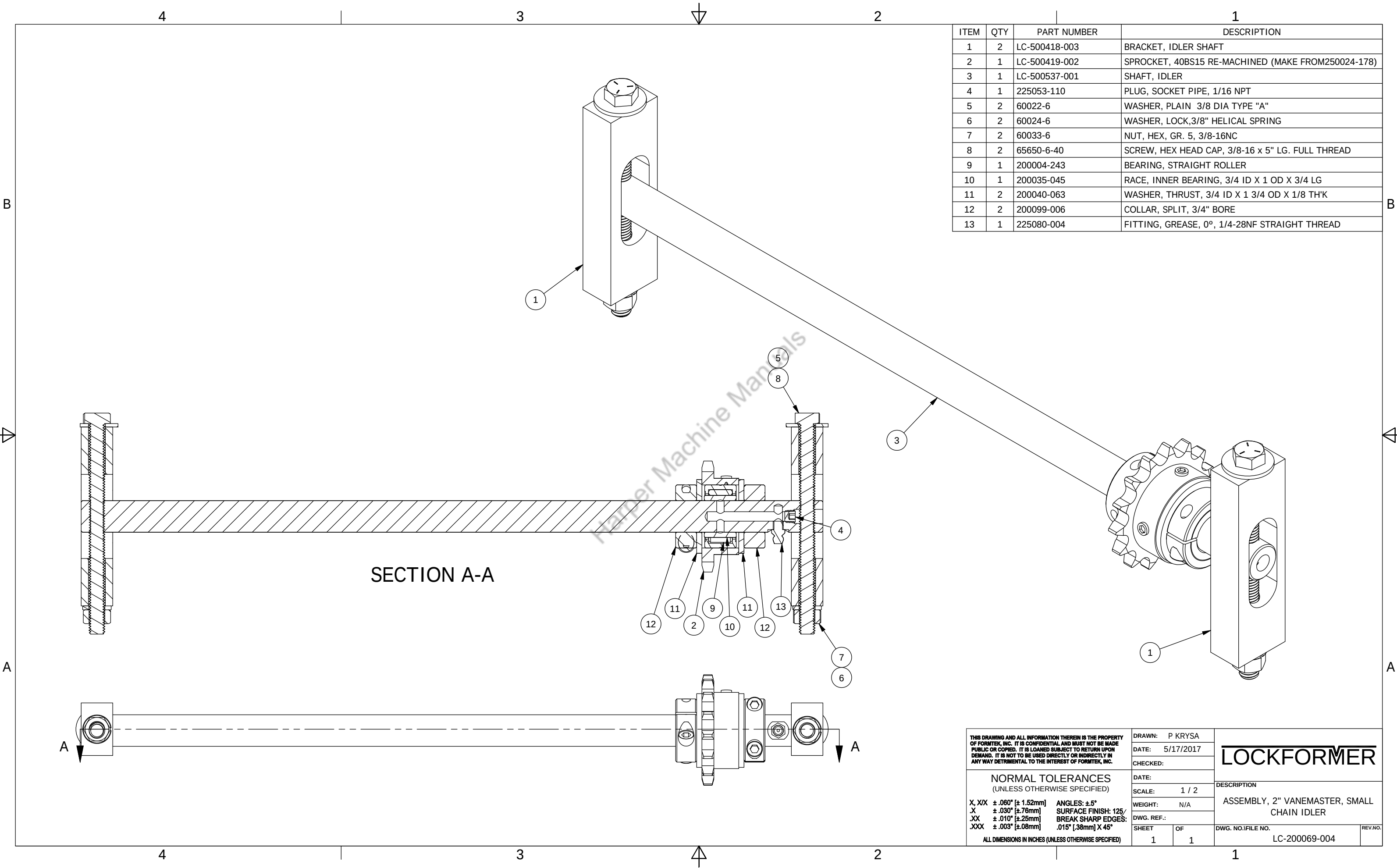


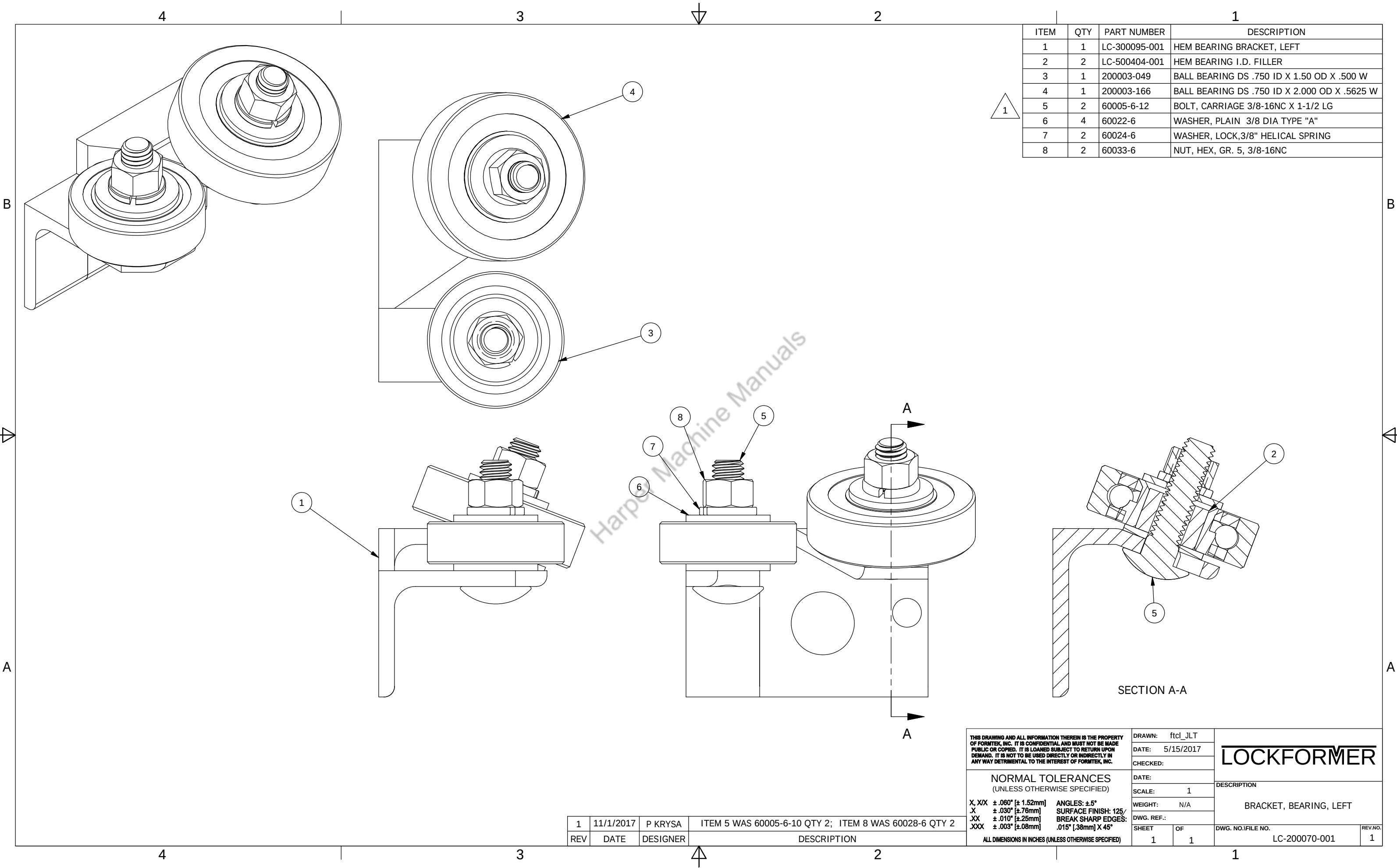
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	DATE: 4/21/2017				
	CHECKED:		DESCRIPTION		
	DATE:				
SCALE: 1 / 2					
NORMAL TOLERANCES (UNLESS OTHERWISE SPECIFIED)	WEIGHT: 19 lbmass		ROLL, BOTTOM FLATTENING		
	DWG. REF.: 202				
	SHEET				
	OF		DWG. NO. FILE NO.		
1		1		LC-200063-001	REV.NO.



ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	LC-500391-002	GEAR, FLATTENING ROLL, UPPER
2	1	200102-012	HUB, LOCKING

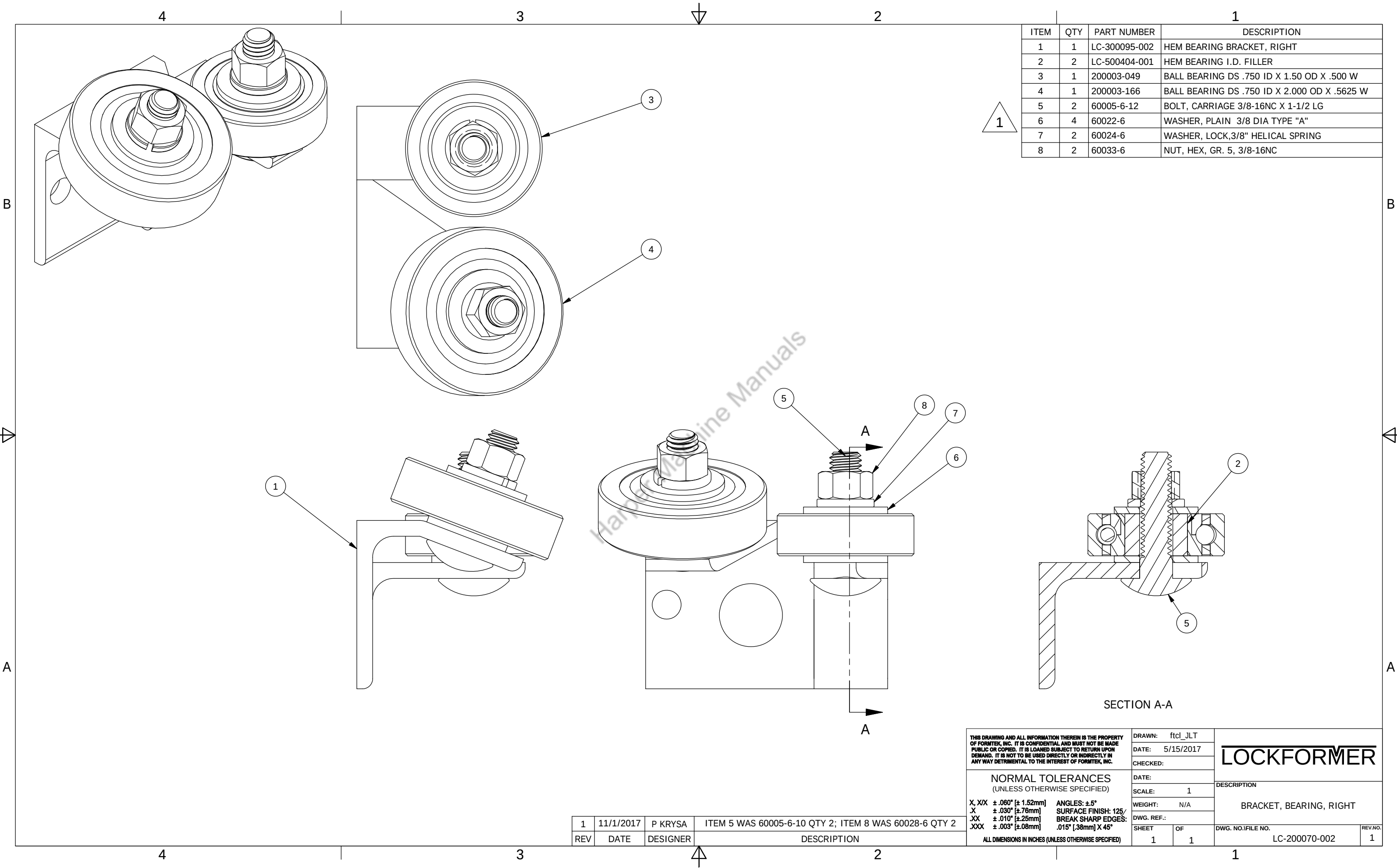
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	DATE: 4/24/2017			
	CHECKED:		DESCRIPTION UPPER FLATTENING ROLL GEAR ASSEMBLY	
	DATE:			
SCALE: 1 : 1				
WEIGHT: 3 lbmass				
DWG. REF.:				
NORMAL TOLERANCES (UNLESS OTHERWISE SPECIFIED) X, X/X ± .060" [± 1.52mm] ANGLES: ± 5° .X ± .030" [± .76mm] SURFACE FINISH: 125/ .XX ± .010" [± .25mm] BREAK SHARP EDGES: .XXX ± .003" [± .08mm] .015" [.38mm] X 45° ALL DIMENSIONS IN INCHES (UNLESS OTHERWISE SPECIFIED)	SHEET	OF	DWG. NO./FILE NO.	REV.NO.
	1	1	LC-200065-001	



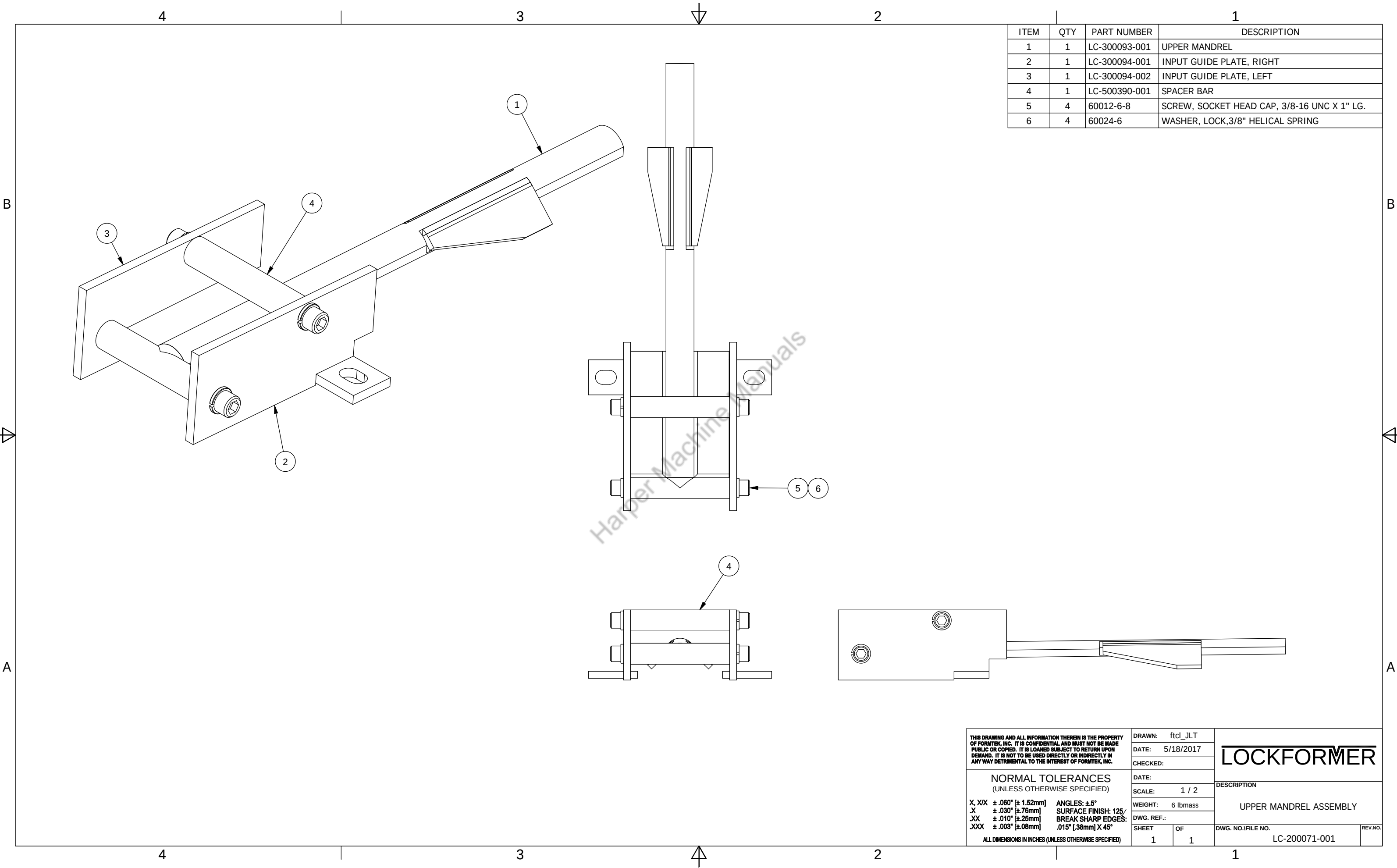


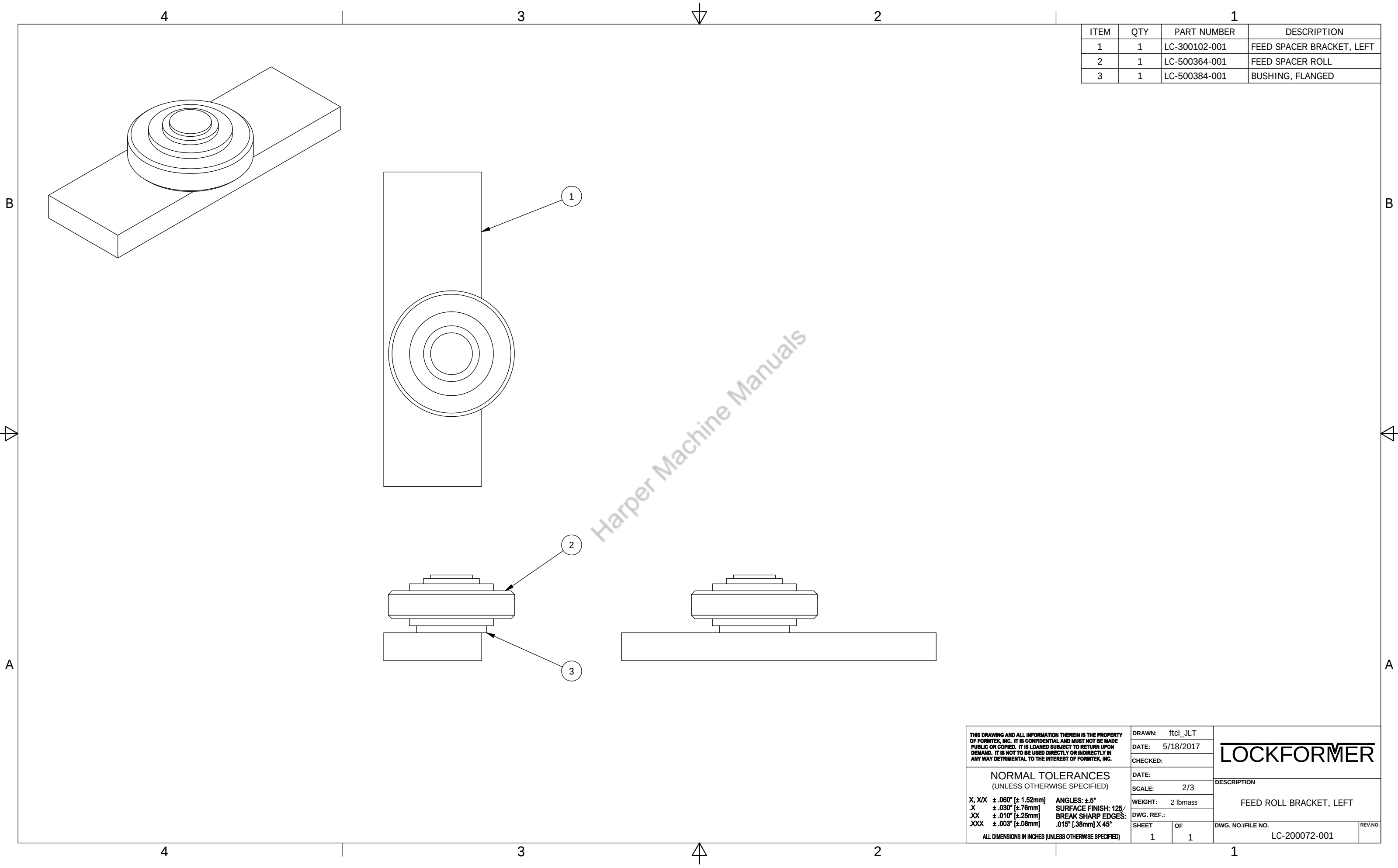
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	LC-300095-001	HEM BEARING BRACKET, LEFT
2	2	LC-500404-001	HEM BEARING I.D. FILLER
3	1	200003-049	BALL BEARING DS .750 ID X 1.50 OD X .500 W
4	1	200003-166	BALL BEARING DS .750 ID X 2.000 OD X .5625 W
5	2	60005-6-12	BOLT, CARRIAGE 3/8-16NC X 1-1/2 LG
6	4	60022-6	WASHER, PLAIN 3/8 DIA TYPE "A"
7	2	60024-6	WASHER, LOCK,3/8" HELICAL SPRING
8	2	60033-6	NUT, HEX, GR. 5, 3/8-16NC

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	DATE: 5/15/2017					
	CHECKED:					
	DATE:					
NORMAL TOLERANCES (UNLESS OTHERWISE SPECIFIED) X, XX ± .060" [± 1.52mm] ANGLES: ± 5° .X ± .030" [± .76mm] SURFACE FINISH: 125/ .XX ± .010" [± .25mm] BREAK SHARP EDGES: .XXX ± .003" [± .08mm] .015" [.38mm] X 45° ALL DIMENSIONS IN INCHES (UNLESS OTHERWISE SPECIFIED)						
				SCALE: 1		
				WEIGHT: N/A		
				DWG. REF.:		
SHEET 1		OF 1				



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	DATE: 5/15/2017		
	CHECKED:		
	DATE:		
NORMAL TOLERANCES (UNLESS OTHERWISE SPECIFIED)	SCALE: 1		DESCRIPTION BRACKET, BEARING, RIGHT
	WEIGHT: N/A		
	DWG. REF.:		
	SHEET 1	OF 1	
X, XX ± .060" [± 1.52mm] .X ± .030" [± .76mm] .XX ± .010" [± .25mm] .XXX ± .003" [± .08mm]	ANGLES: ± 5° SURFACE FINISH: 125/ BREAK SHARP EDGES: .015" [.38mm] X 45°		DWG. NO./FILE NO. LC-200070-002
ALL DIMENSIONS IN INCHES (UNLESS OTHERWISE SPECIFIED)			REV.NO. 1





ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	LC-300102-001	FEED SPACER BRACKET, LEFT
2	1	LC-500364-001	FEED SPACER ROLL
3	1	LC-500384-001	BUSHING, FLANGED

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		DATE: 5/18/2017			
		CHECKED:		DESCRIPTION	
		DATE:			
NORMAL TOLERANCES (UNLESS OTHERWISE SPECIFIED) X, X/X .060" [± 1.52mm] ANGLES: ± 5° .X .030" [± .76mm] SURFACE FINISH: 125/ .XX .010" [± .25mm] BREAK SHARP EDGES: .XXX ± .003" [± .08mm] .015" [.38mm] X 45° ALL DIMENSIONS IN INCHES (UNLESS OTHERWISE SPECIFIED)		SCALE: 2/3			
		WEIGHT: 2 lbmass			
		DWG. REF.:			
		SHEET	OF	DWG. NO./FILE NO.	
1	1	LC-200072-001			

4

3

2

1

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	LC-500364-002	STRAIGHTENING ROLL
2	1	LC-500364-005	STRAIGHTENING ROLL SHAFT
3	2	200019-001	RING, RETAINING
4	2	200081-001	BUSHING, BRONZE

B

B

A

A

A

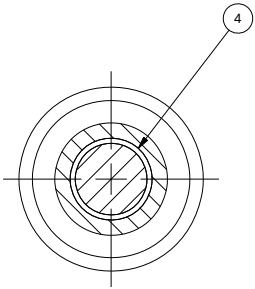
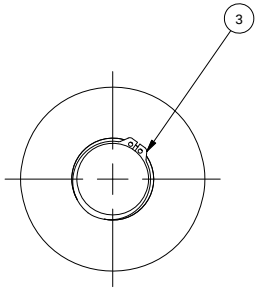
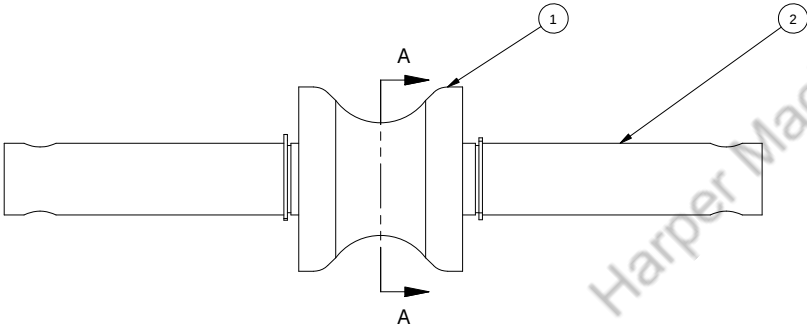
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4

3

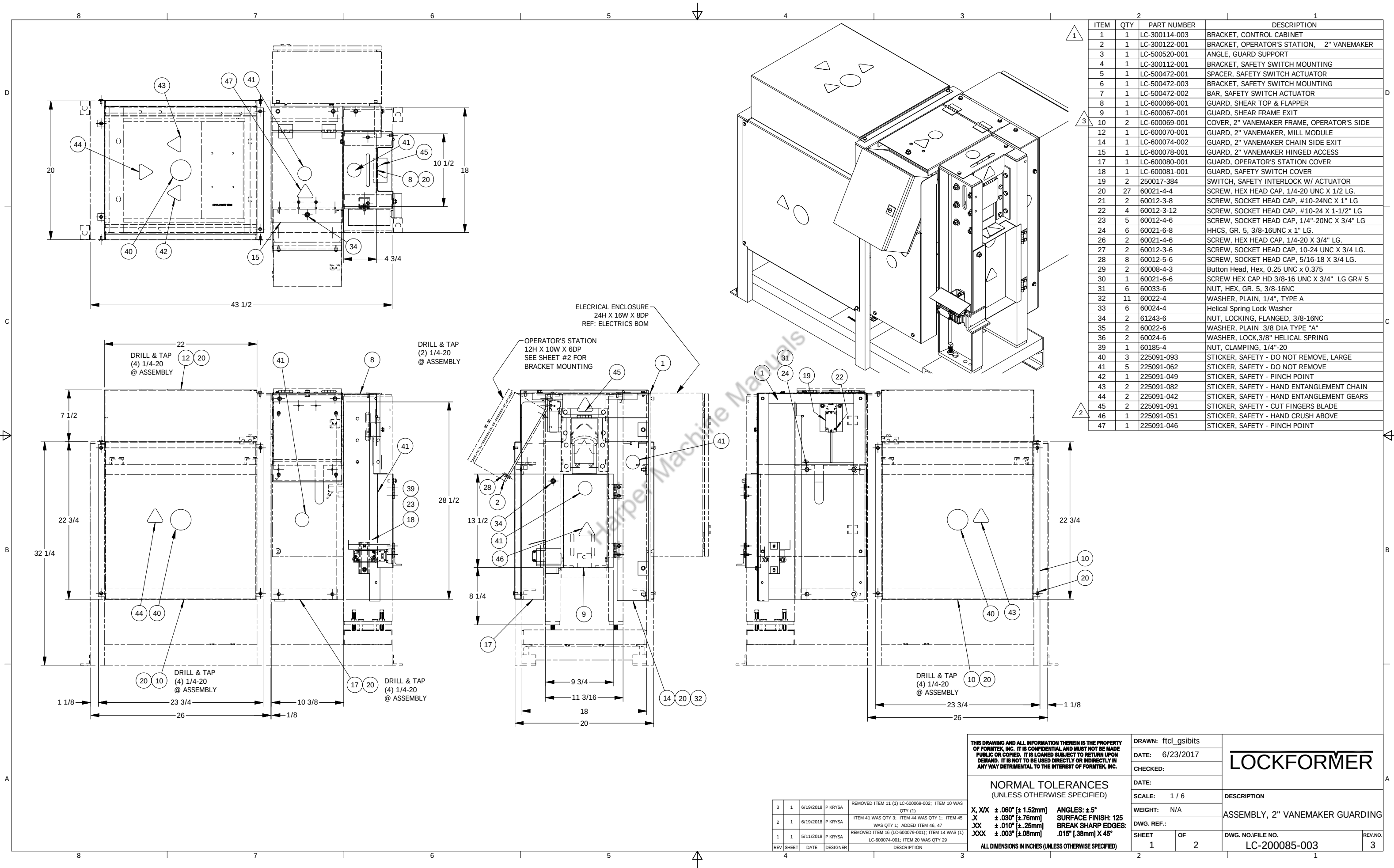
2

1



SECTION A-A

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	DATE: 5/18/2017			
	CHECKED:		DESCRIPTION STRAIGHTENING ROLL	
	DATE:			
SCALE: 2/3				
NORMAL TOLERANCES (UNLESS OTHERWISE SPECIFIED) X, XX ±.000" [± 1.52mm] ANGLES: ±.5° X ±.000" [±.76mm] SURFACE FINISH: 125/ XX ±.010" [±.25mm] BREAK SHARP EDGES: XXX ±.003" [±.08mm] .015" [3.8mm] X 45° ALL DIMENSIONS IN INCHES (UNLESS OTHERWISE SPECIFIED)	WEIGHT: 3 lbmass		DWG. NO./FILE NO. LC-200073-001	
	DWG. REF.:			
	SHEET 1 OF 1		REV. NO.	



ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	LC-300114-003	BRACKET, CONTROL CABINET
2	1	LC-300122-001	BRACKET, OPERATOR'S STATION, 2" VANEMAKER
3	1	LC-500520-001	ANGLE, GUARD SUPPORT
4	1	LC-300112-001	BRACKET, SAFETY SWITCH MOUNTING
5	1	LC-500472-001	SPACER, SAFETY SWITCH ACTUATOR
6	1	LC-500472-003	BRACKET, SAFETY SWITCH MOUNTING
7	1	LC-500472-002	BAR, SAFETY SWITCH ACTUATOR
8	1	LC-600066-001	GUARD, SHEAR TOP & FLAPPER
9	1	LC-600067-001	GUARD, SHEAR FRAME EXIT
10	2	LC-600069-001	COVER, 2" VANEMAKER FRAME, OPERATOR'S SIDE
12	1	LC-600070-001	GUARD, 2" VANEMAKER, MILL MODULE
14	1	LC-600074-002	GUARD, 2" VANEMAKER CHAIN SIDE EXIT
15	1	LC-600078-001	GUARD, 2" VANEMAKER HINGED ACCESS
17	1	LC-600080-001	GUARD, OPERATOR'S STATION COVER
18	1	LC-600081-001	GUARD, SAFETY SWITCH COVER
19	2	250017-384	SWITCH, SAFETY INTERLOCK W/ ACTUATOR
20	27	60021-4-4	SCREW, HEX HEAD CAP, 1/4-20 UNC X 1/2 LG.
21	2	60012-3-8	SCREW, SOCKET HEAD CAP, #10-24NC X 1" LG
22	4	60012-3-12	SCREW, SOCKET HEAD CAP, #10-24 X 1-1/2" LG
23	5	60012-4-6	SCREW, SOCKET HEAD CAP, 1/4"-20NC X 3/4" LG
24	6	60021-6-8	HHCS, GR. 5, 3/8-16UNC x 1" LG.
26	2	60021-4-6	SCREW, HEX HEAD CAP, 1/4-20 X 3/4" LG.
27	2	60012-3-6	SCREW, SOCKET HEAD CAP, 10-24 UNC X 3/4 LG.
28	8	60012-5-6	SCREW, SOCKET HEAD CAP, 5/16-18 X 3/4 LG.
29	2	60008-4-3	Button Head, Hex, 0.25 UNC x 0.375
30	1	60021-6-6	SCREW HEX CAP HD 3/8-16 UNC X 3/4" LG GR# 5
31	6	60033-6	NUT, HEX, GR. 5, 3/8-16NC
32	11	60022-4	WASHER, PLAIN, 1/4", TYPE A
33	6	60024-4	Helical Spring Lock Washer
34	2	61243-6	NUT, LOCKING, FLANGED, 3/8-16NC
35	2	60022-6	WASHER, PLAIN 3/8 DIA TYPE "A"
36	2	60024-6	WASHER, LOCK,3/8" HELICAL SPRING
39	1	60185-4	NUT, CLAMPING, 1/4"-20
40	3	225091-093	STICKER, SAFETY - DO NOT REMOVE, LARGE
41	5	225091-062	STICKER, SAFETY - DO NOT REMOVE
42	1	225091-049	STICKER, SAFETY - PINCH POINT
43	2	225091-082	STICKER, SAFETY - HAND ENTANGLEMENT CHAIN
44	2	225091-042	STICKER, SAFETY - HAND ENTANGLEMENT GEARS
45	2	225091-091	STICKER, SAFETY - CUT FINGERS BLADE
46	1	225091-051	STICKER, SAFETY - HAND CRUSH ABOVE
47	1	225091-046	STICKER, SAFETY - PINCH POINT

3	1	6/19/2018	P KRYSA	REMOVED ITEM 11 (1) LC-600069-002; ITEM 10 WAS QTY (1)
2	1	6/19/2018	P KRYSA	ITEM 41 WAS QTY 3; ITEM 44 WAS QTY 1; ITEM 45 WAS QTY 1; ADDED ITEM 46, 47
1	1	5/11/2018	P KRYSA	REMOVED ITEM 16 (LC-600079-001); ITEM 14 WAS (1) LC-600074-001; ITEM 20 WAS QTY 29
REV	SHEET	DATE	DESIGNER	DESCRIPTION

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NORMAL TOLERANCES
(UNLESS OTHERWISE SPECIFIED)

X, X/X ±.080" [± 1.52mm]
.X ±.030" [±.76mm]
.XX ±.010" [±.25mm]
.XXX ±.003" [±.08mm]

ANGLES: ±5°
SURFACE FINISH: 125
BREAK SHARP EDGES:
.015" [.38mm] X 45°

ALL DIMENSIONS IN INCHES (UNLESS OTHERWISE SPECIFIED)

DRAWN: ftcl_gsibits

DATE: 6/23/2017

CHECKED:

DATE:

SCALE: 1 / 6

WEIGHT: N/A

DWG. REF.:

SHEET

OF

1

2

LOCKFORMER

DESCRIPTION

ASSEMBLY, 2" VANEMAKER GUARDING

DWG. NO./FILE NO.

LC-200085-003

REV.NO.

3

**SINGLE LINE BILL OF MATERIAL FOR
ASSEMBLY NUMBER: LC-100056-002
2" VANEMAKER,
230V/3P/60HZ,
(PK) 11/15/17**

DRAWING NUMBER: LC-100056-002

CURRENT REVISION: -

LATEST REVISION:

JOB NUMBER:

PSM: M

REVISION LEVEL: -

CATEGORY: BOM

CLASS:

SUBCLASS:

ITEM	COMPONENT PART NUMBER	DESCRIPTION	QUANTITY	UOM
001	LC-100048-001	FORMING HEAD, 2" VANEMAKER	1.00	EA
002	LC-100049-001	ASSEMBLY, DRIVE MECHANICALS,	1.00	EA
003	LC-100050-002	ASSEMBLY, 2" VANEMAKER SHEAR	1.00	EA
004	LC-100052-001	ASSEMBLY, 48" LENGTH GAUGE,	1.00	EA
005	LC-100057-001	ASSEMBLY, BASE,	1.00	EA
006	LC-200085-003	ASSEMBLY, 2" VANEMAKER GUARDING	1.00	EA
010	LC-700016-231	ELECTRICAL CONTROL PANEL,	1.00	EA
010A	LC-700016-231VA	SET OF APPROVAL DWGS (PRIOR TO MFG.)	1.00	ST
010B	LC-700016-231VB	MAINTENANCE & OPERATING INSTRUCTIONS,	1.00	EA
013	YD-700003-001	SAFETY STICKERS, 240VAC ELECTRICAL	1.00	EA
014	290187-320	CARD, MICROSD HC, 16GB CAPACITY,	1.00	EA

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SINGLE LINE BILL OF MATERIAL FOR
ASSEMBLY NUMBER: LC-100048-001
FORMING HEAD, 2" VANEMAKER
(BAB) 5/30/17 10/31/17A

DRAWING NUMBER: LC-100048-001

CURRENT REVISION: A

LATEST REVISION: A

JOB NUMBER: PSM: M

REVISION LEVEL: -

CATEGORY: BOM

CLASS:

SUBCLASS:

ITEM	COMPONENT PART NUMBER	DESCRIPTION	QUANTITY	UOM
001	LC-200062-001	TOP FORMING ROLL ASSEMBLY	1.00	EA
002	LC-200063-001	BOTTOM FLATTENING ROLL ASSEMBLY	1.00	EA
003	LC-200065-001	UPPER FLATTENING ROLL GEAR ASSEMBLY	1.00	EA
004	LC-200070-001	BEARING BRACKET ASSEMBLY, LEFT	1.00	EA
005	LC-200070-002	BEARING BRACKET ASSEMBLY, RIGHT	1.00	EA
006	LC-200071-001	UPPER MANDREL ASSEMBLY	1.00	EA
007	LC-200072-001	FEED ROLL BRACKET ASSEMBLY, LEFT	1.00	EA
008	LC-200072-002	FEED ROLL BRACKET ASSEMBLY, RIGHT	1.00	EA
009	LC-200073-001	STRAIGHTENING ROLL ASSEMBLY	1.00	EA
010	LC-200074-001	GUIDE ROLL ASSEMBLY	1.00	EA
012	LC-300093-002	MANDREL, LOWER	1.00	EA
013	LC-500340-001	PLATE, SIDE, LEFT, BOTTOM	1.00	EA
014	LC-500340-002	PLATE, SIDE, RIGHT, BOTTOM	1.00	EA
015	LC-500340-003	PLATE, SIDE, LEFT, TOP	1.00	EA
016	LC-500340-004	PLATE, SIDE, RIGHT, TOP	1.00	EA
017	LC-500355-001	ROLL, TOP FLATTENING	1.00	EA
018	LC-500349-002	ROLL, BOTTOM FORMING	1.00	EA
019	LC-500364-004	ROLL, FEED	2.00	EA
020	LC-500365-001	BAR, SPACER, HOLES	1.00	EA
021	LC-500365-002	BAR, SPACER, HOLE, CUT	1.00	EA
022	LC-500365-003	BAR, SPACER	1.00	EA
023	LC-500366-001	PUNCH, SEAM DIMPLE	6.00	EA
024	LC-500368-003	BAR, SPACER, NO GROOVES	1.00	EA
025	LC-500391-001	GEAR, FLATTENING ROLL, LOWER,	1.00	EA
026	LC-500417-001	SPROCKET, LOWER FORMING ROLL	1.00	EA
027	LC-500421-001	BLOCK, ALIGNMENT, ENTRY, INBOARD	1.00	EA
028	LC-500421-002	BLOCK, ALIGNMENT, ENTRY, OUTBOARD	1.00	EA
029	LC-500422-001	BLOCK, ALIGNMENT, EXIT	2.00	EA
030	60012-4-8	SCREW, SOCKET HEAD CAP	8.00	EA
031	60012-5-12	SCREW, SOCKET HEAD CAP	6.00	EA

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SINGLE LINE BILL OF MATERIAL FOR
ASSEMBLY NUMBER: LC-100048-001
FORMING HEAD, 2" VANEMAKER
(BAB) 5/30/17 10/31/17A

DRAWING NUMBER: LC-100048-001

CURRENT REVISION: A

LATEST REVISION: A

JOB NUMBER: PSM: M

REVISION LEVEL: -

CATEGORY: BOM

CLASS:

SUBCLASS:

ITEM	COMPONENT PART NUMBER	DESCRIPTION	QUANTITY	UOM
032	60012-6-8	SCREW, SOCKET HEAD CAP VMI	2.00	EA
033	60012-8-12	SCREW, SOCKET HEAD CAP	15.00	EA
034	60014-4-2	SCREW, SOCKET SET CUP PT,	6.00	EA
035	60014-6-3	SCREW, SOCKET SET CUP POINT	2.00	EA
036	60016-6-10	SCREW, FLAT HEAD SOCKET CAP	2.00	EA
037	60016-8-12	SCREW, FLAT HEAD SOCKET CAP	1.00	EA
038	60021-8-12	SCREW, HEX HEAD CAP	4.00	EA
039	60021-8-40	SCREW, HEX HEAD CAP	9.00	EA
040	60024-5	WASHER, LOCK, HELICAL,	2.00	EA
041	60024-6	WASHER, LOCK	4.00	EA
042	60024-8	WASHER, LOCK, HELICAL-SPRING	15.00	EA
043	60028-5	NUT, HEX JAM	2.00	EA
044	60026-6	WASHER, ZIP - STEEL, PLATED	2.00	EA
045	60026-8	WASHER, ZIP - STEEL, PLATED	9.00	EA
046	60028-6	NUT, HEX JAM	4.00	EA
047	60028-8	NUT, HEX JAM	4.00	EA
048	60379-6-26	PIN, DOWEL, STANDARD, ALLOY STEEL,	4.00	EA
049	65650-6-18	SCREW, HEX HEAD CAP, FULL THREAD,	2.00	EA
050	200061-037	BUSHING, BRONZE, FLANGED,	4.00	EA
051	200061-067	BUSHING, FLANGED,	8.00	EA
052	200141-048	NUT, CLAMP,	2.00	EA
053	225124-003	KEY, SQUARE	6.00	EA
054	225138-197	SPRING, COMPRESSION, HEAVY DUTY	9.00	EA
055	225181-095	FITTING, TUBE, ELBOW, SWIVEL 90°,	6.00	EA
056	225183-058	FITTING, TUBE	6.00	EA
057	250024-240	SPROCKET, ROLLER CHAIN, SINGLE WIDTH,	1.00	EA
058	250024-243	SPROCKET, ROLLER CHAIN, SINGLE WIDTH,	2.00	EA
059	250051-007	FITTING, OIL, STRAIGHT,	6.00	EA
060	250051-008	CUP, OIL, STRAIGHT,	2.00	EA
061	250117-019	TUBING, NYLON	10.00	FT

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**SINGLE LINE BILL OF MATERIAL FOR
ASSEMBLY NUMBER: LC-100048-001
FORMING HEAD, 2" VANEMAKER
(BAB) 5/30/17 10/31/17A**

DRAWING NUMBER: LC-100048-001

CURRENT REVISION: A

LATEST REVISION: A

JOB NUMBER: PSM: M

REVISION LEVEL: -

CATEGORY: BOM

CLASS:

SUBCLASS:

ITEM	COMPONENT PART NUMBER	DESCRIPTION	QUANTITY	UOM
062	250236-062	MANIFOLD, ALUMINUM, STRAIGHT-FLOW,	2.00	EA
063	250024-246	SPROCKET, ROLLER CHAIN,	1.00	EA
064	LC-500373-002	SPROCKET	1.00	EA
065	LC-500535-001	SPACER, LUBE	1.00	EA
066	60016-4-4	SCREW, FLAT HEAD SOCKET CAP	2.00	EA
067	60614-3-12	SCREW, SOCKET HEAD CAP	4.00	EA

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SINGLE LINE BILL OF MATERIAL FOR
ASSEMBLY NUMBER: LC-100049-001
ASSEMBLY, DRIVE MECHANICALS,
2" VANEMAKER
(GS) 5/31/17 11/9/17b

DRAWING NUMBER: LC-100049-001

CURRENT REVISION: B

LATEST REVISION: B

JOB NUMBER: PSM: M

REVISION LEVEL: -

CATEGORY: CLASS:

SUBCLASS:

ITEM	COMPONENT PART NUMBER	DESCRIPTION	QUANTITY	UOM
001	LC-300099-001	BASE, GEARMOTOR ADJUSTMENT	1.00	EA
002	250070-108	REDUCER, WORM GEAR, SINGLE RED., 40:1	1.00	EA
003	250024-244	SPROCKET, ROLLER CHAIN, SINGLE WIDTH,	1.00	EA
004	225128-009	KEY, SQUARE	1.00	EA
005	250019-093	MOTOR, AC, 3 HP, 1765 RPM, 460V/3P/60HZ,	1.00	EA
006	LC-200069-003	ASSEMBLY, 2" VANEMAKER,	1.00	EA
007	LC-200069-001	ASSEMBLY, 2" VANEMAKER,	1.00	EA
008	LC-200069-004	ASSEMBLY, 2" VANEMAKER, CHAIN IDLER	1.00	EA
009	225141-153	ROD, THREADED, 3/4-10 X 6" LG., R.H.,	2.00	EA
010	60033-12	NUT, HEX, RIGHT HAND COARSE THREAD,	8.00	EA
011	60022-12	WASHER, PLAIN, TYPE "A", WIDE	4.00	EA
012	60021-6-6	SCREW, HEX HEAD CAP	3.00	EA
013	60022-6	WASHER, PLAIN, TYPE "A", WIDE	9.00	EA
014	60021-8-8	SCREW, HEX HEAD CAP	4.00	EA
015	60022-8	WASHER, PLAIN, TYPE "A", WIDE STEEL	8.00	PC
016	60027-8	WASHER, PLAIN - NARROW	8.00	EA
017	60021-6-8	SCREW, HEX HEAD CAP	6.00	EA
018	60024-6	WASHER, LOCK	10.00	EA
019	60033-6	NUT, HEX, RIGHT HAND COARSE THREAD,	6.00	EA
020	250027-171	CHAIN, ROLLER, #50, 5/8" PITCH,	1.00	EA
021	250027-172	CHAIN, ROLLER, #40, 1/2" PITCH,	1.00	EA
022	60021-8-12	SCREW, HEX HEAD CAP	4.00	EA
023	60021-6-5	SCREW, HEX HEAD CAP	4.00	EA
024	250170-012	BREATHER, VENT, 1/4 NPT MALE, 9/16 HEX,	1.00	EA

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SINGLE LINE BILL OF MATERIAL FOR
ASSEMBLY NUMBER: LC-100050-002
ASSEMBLY, 2" VANEMAKER SHEAR
(GS) 7/19/17 11/10/17C

DRAWING NUMBER: LC-100050-002

CURRENT REVISION: C

LATEST REVISION: C

JOB NUMBER: PSM: M

REVISION LEVEL: 1

CATEGORY: CLASS:

SUBCLASS:

ITEM	COMPONENT PART NUMBER	DESCRIPTION	QUANTITY	UOM
001	LC-300101-004	CHANNEL, SHEAR UPRIGHT, OPERATOR'S SIDE	1.00	EA
002	LC-300101-003	CHANNEL, SHEAR UPRIGHT, CHAIN SIDE	1.00	EA
003	LC-500412-001	ANGLE, SHEAR DIE MOUNT, LEFT	2.00	EA
004	LC-500412-002	ANGLE, SHEAR DIE MOUNT, RIGHT	2.00	EA
005	LC-500407-001	DIE, SHEAR, 2" VANE,	1.00	ST
006	LC-500413-001	SPACER, SHEAR TOP	2.00	EA
007	LC-500410-001	SHEAR BLADE GUSSET	4.00	EA
008	LC-500409-001	SHEAR BLADE GUIDE	2.00	EA
009	LC-500408-001	BLADE, SHEAR, 2" VANE,	1.00	EA
010	LC-500411-001	BLADE HOLDER	1.00	EA
011	LC-300103-001	BASE, SHEAR CYLINDER MOUNTING	1.00	EA
012	200056-146	CYLINDER, HYDRAULIC, (HARPER #1.067)	1.00	EA
013	LC-300106-002	BRACKET, PROX TARGET	1.00	EA
014	LC-500474-001	STRUT, PROX MOUNTING	1.00	EA
015	LC-500475-001	BRACKET, PROX MOUNTING	2.00	EA
016	250017-490	SWITCH, PROXIMITY, M12 X 1, NON-EMBED,	2.00	EA
017	250102-220	CABLE, M12 90° CONNECTOR,	2.00	EA
018	60021-6-8	SCREW, HEX HEAD CAP	18.00	EA
019	60022-6	WASHER, PLAIN, TYPE "A", WIDE	24.00	EA
020	60024-6	WASHER, LOCK	24.00	EA
021	60033-6	NUT, HEX, RIGHT HAND COARSE THREAD,	24.00	EA
022	60021-6-18	SCREW, HEX HEAD CAP	8.00	EA
023	60016-5-16	SCREW, FLAT HEAD SOCKET CAP	2.00	EA
024	60024-5	WASHER, LOCK, HELICAL,	6.00	EA
025	60033-5	NUT, HEX, RIGHT HAND COARSE THREAD,	2.00	EA
026	60021-4-6	SCREW, HEX HEAD CAP	6.00	EA
027	60022-4	WASHER, PLAIN, TYPE "A", WIDE VMI	2.00	EA
028	60024-4	WASHER, LOCK, HELICAL-SPRING, REGUL	2.00	EA
029	60030-12	NUT, HEX JAM	1.00	EA
030	60022-5	WASHER, PLAIN, 5/16 TYPE "A", WIDE VMI	4.00	EA

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SINGLE LINE BILL OF MATERIAL FOR
ASSEMBLY NUMBER: LC-100050-002
ASSEMBLY, 2" VANEMAKER SHEAR
(GS) 7/19/17 11/10/17C

DRAWING NUMBER: LC-100050-002

CURRENT REVISION: C

LATEST REVISION: C

JOB NUMBER: PSM: M

REVISION LEVEL: 1

CATEGORY: CLASS:

SUBCLASS:

ITEM	COMPONENT PART NUMBER	DESCRIPTION	QUANTITY	UOM
031	60006-8-20	SCREW, SQUARE HEAD SET CUP POINT	4.00	EA
032	60028-8	NUT, HEX JAM	4.00	EA
033	65650-8-22	SCREW, HEX HEAD CAP, FULL THREADED,	4.00	EA
034	60021-5-6	SCREW, HEX HEAD CAP	4.00	EA
035	60012-4-5	SCREW, SOCKET HEAD CAP	2.00	EA
036	60185-11	NUT, CLAMPING - W/SPRING	2.00	EA
037	250224-046	HYDRAULIC POWER UNIT, (HARPER #49)	1.00	EA
038	250236-061	MANIFOLD, ADAPTER, FOR DIRECTIONAL	1.00	EA
039	250209-091	VALVE, HYDRAULIC, DIRECTIONAL, D03	1.00	EA
040	250118-042	CONNECTOR, STRAIGHT, SAE 6 W/O-RING	2.00	EA
041	250118-068	CONNECTOR, HOSE, 90° LONG ELBOW	2.00	EA
042	250118-105	CONNECTOR, HOSE, HIGH PRESSURE,	4.00	EA
043	LC-300113-001	SUPPORT, EXIT TABLE	1.00	EA
044	LC-300107-001	EXIT TABLE	1.00	EA
045	60021-6-24	SCREW, HEX HEAD CAP	1.00	EA
046	225138-170	SPRING, COMPRESSION, MEDIUM	1.00	EA
047	60028-6	NUT, HEX JAM	2.00	EA
048	60021-6-6	SCREW, HEX HEAD CAP	1.00	EA
049	250117-097	HOSE, HYDRAULIC, 3000 PSI WORKING,	5.00	FT
050	LC-300115-001	GUIDE, EXIT TABLE VANE, OPERATOR'S SIDE	1.00	EA
051	LC-300115-002	GUIDE, EXIT TABLE VANE, CHAIN SIDE	1.00	EA
052	60012-4-4	SCREW, SOCKET HEAD CAP	6.00	EA
053	250102-073	CABLE - 18mm DIN CONNECTOR WITH DIODE	2.00	EA
054	60026-4	WASHER, ZIP - STEEL, PLATED	1.00	EA

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SINGLE LINE BILL OF MATERIAL FOR
ASSEMBLY NUMBER: LC-100052-001
ASSEMBLY, 48" LENGTH GAUGE,
2" VANEMAKER
(PK) 6/23/17 11/20/17B

DRAWING NUMBER: LC-100052-001

CURRENT REVISION: B

LATEST REVISION: B

JOB NUMBER: PSM: M

REVISION LEVEL: -

CATEGORY: BOM

CLASS:

SUBCLASS:

ITEM	COMPONENT PART NUMBER	DESCRIPTION	QUANTITY	UOM
001	LC-500465-001	BRACKET, MOUNTING, LENGTH GAUGE	1.00	EA
002	LC-500466-001	BRACKET, LIMIT SWITCH, LENGTH GAUGE	1.00	EA
003	LC-500466-002	BRACKET, CABLE CARRIER, LENGTH GAUGE	1.00	EA
004	LC-500467-001	BRACKET, CORNER, LENGTH GAUGE	1.00	EA
005	LC-500468-001	BRACKET, SUPPORT, LENGTH GAUGE	1.00	EA
006	LC-500468-002	BRACKET, BAR, LENGTH GAUGE	1.00	EA
007	LC-500469-001	EXTRUSION, LENGTH GAUGE	1.00	EA
008	LC-500470-001	SCALE, LENGTH GAUGE	1.00	EA
009	LC-600068-001	POINTER, LENGTH GAUGE	1.00	EA
010	200092-004	BEARING, SPHERICAL ROD END,	1.00	EA
011	200092-005	BEARING, SPHERICAL ROD END,	1.00	EA
012	225324-053	T-NUT, ECONOMY, DOUBLE SLIDE-IN,	5.00	EA
013	225324-059	T-NUT, DROP-IN, SERIES 15 & 40, 10-32	7.00	EA
014	225332-010	FOOT, LEVELING, STEEL, ZINC PLATED,	1.00	EA
015	250017-510	SWITCH, LIMIT, SIDE ROTARY,	1.00	EA
016	250229-073	BEARING, LINEAR, UHMW PILLOW BLOCK,	1.00	EA
017	250229-074	BRAKE KIT, LINEAR BEARING,	1.00	EA
018	250306-011	EXTRUSION, T-SLOTTED ALUMINUM,	2.00	EA
019	250307-023	EXTRUSION, END CAP, 1-1/2",	1.00	EA
020	250315-034	TRACK, POWER, E2 MINI SERIES, 15mm	1.00	EA
021	60012-2-12	SCREW, SOCKET HEAD CAP	4.00	EA
022	60021-5-30	SCREW, HEX HEAD CAP	2.00	EA
023	60021-5-7	SCREW, HEX HEAD CAP	15.00	EA
024	60021-6-8	SCREW, HEX HEAD CAP	2.00	EA
025	60024-5	WASHER, LOCK, HELICAL,	8.00	EA
026	60025-5	WASHER, BEVEL, STANDARD, NOMINAL SIZE:	3.00	EA
027	60030-6	NUT, HEX JAM	1.00	EA
028	60033-5	NUT, HEX, RIGHT HAND COARSE THREAD,	2.00	EA

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**SINGLE LINE BILL OF MATERIAL FOR
ASSEMBLY NUMBER: LC-100052-001
ASSEMBLY, 48" LENGTH GAUGE,
2" VANEMAKER
(PK) 6/23/17 11/20/17B**

DRAWING NUMBER: LC-100052-001

CURRENT REVISION: B

LATEST REVISION: B

JOB NUMBER: PSM: M

REVISION LEVEL: -

CATEGORY: BOM CLASS:

SUBCLASS:

ITEM	COMPONENT PART NUMBER	DESCRIPTION	QUANTITY	UOM
029	60041-3-4	SCREW, ROUND HEAD SLOTTED MACHINE	9.00	EA
030	250102-161	CABLE, M12 4 PIN MALE STRAIGHT	1.00	EA

Harper Machine Manuals

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**SINGLE LINE BILL OF MATERIAL FOR
ASSEMBLY NUMBER: LC-100057-001
ASSEMBLY, BASE,
2" VANEMAKER
(PK) 10/23/17**

DRAWING NUMBER: LC-100057-001

CURRENT REVISION: -

LATEST REVISION:

JOB NUMBER:

PSM: M

REVISION LEVEL: -

CATEGORY: BOM

CLASS:

SUBCLASS:

ITEM	COMPONENT PART NUMBER	DESCRIPTION	QUANTITY	UOM
001	LC-300096-001	FRAME, 2" VANEMAKER MAIN	1.00	EA
002	LC-500138-001	PLATE, SERIAL NUMBER, COMPLETE PER	1.00	EA
003	62882-3-4	SCREW, DRIVE VMI	4.00	EA

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**SINGLE LINE BILL OF MATERIAL FOR
ASSEMBLY NUMBER: LC-200062-001
TOP FORMING ROLL ASSEMBLY
(BAB) 5/30/17**

DRAWING NUMBER: LC-200062-001

CURRENT REVISION: -

LATEST REVISION:

JOB NUMBER:

PSM: S

REVISION LEVEL: -

CATEGORY: MAN INVTRY

CLASS: MAN IN

SUBCLASS:

ITEM	COMPONENT PART NUMBER	DESCRIPTION	QUANTITY	UOM
001	LC-500343-001	SHAFT, TOP FORMING ROLL	1.00	EA
002	LC-500349-001	ROLL, TOP FORMING	1.00	EA
003	200141-048	NUT, CLAMP,	1.00	EA
004	225069-102	KEY, SQUARE	1.00	EA

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**SINGLE LINE BILL OF MATERIAL FOR
ASSEMBLY NUMBER: LC-200063-001
BOTTOM FLATTENING ROLL ASSEMBLY
(BAB) 5/30/17**

DRAWING NUMBER: LC-200063-001

CURRENT REVISION: -

LATEST REVISION:

JOB NUMBER:

PSM: S

REVISION LEVEL: -

CATEGORY: MAN INVTRY

CLASS: MAN IN

SUBCLASS:

ITEM	COMPONENT PART NUMBER	DESCRIPTION	QUANTITY	UOM
001	LC-500385-001	SHAFT, BOTTOM FLATTENING ROLL	1.00	EA
002	LC-500386-001	HUB, BOTTOM FLATTENING ROLL, INBOARD	1.00	EA
003	LC-500386-002	HUB, BOTTOM FLATTENING ROLL, OUTBOARD	1.00	EA
004	LC-500387-001	ROLL, BOTTOM FLATTENING	1.00	EA
005	LC-500388-001	WASHER, THRUST,	2.00	EA
006	LC-500389-001	BUSHING, ROLL	1.00	EA
007	200141-050	NUT, CLAMP,	2.00	EA
008	225069-086	KEY, SQUARE	2.00	EA

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SINGLE LINE BILL OF MATERIAL FOR
ASSEMBLY NUMBER: LC-200065-001
UPPER FLATTENING ROLL GEAR ASSEMBLY
(BAB) 5/30/17

DRAWING NUMBER: LC-200065-001

CURRENT REVISION: -

LATEST REVISION:

JOB NUMBER: PSM: S

REVISION LEVEL: -

CATEGORY: MAN INVTRY

CLASS: MAN IN

SUBCLASS:

ITEM	COMPONENT PART NUMBER	DESCRIPTION	QUANTITY	UOM
001	LC-500391-002	GEAR, FLATTENING ROLL, UPPER,	1.00	EA
002	200102-012	HUB, LOCKING,	1.00	EA

Harper Machine Manuals

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**SINGLE LINE BILL OF MATERIAL FOR
ASSEMBLY NUMBER: LC-200069-001
ASSEMBLY, 2" VANEMAKER,
LARGE CHAIN IDLER
9/28/17A**

DRAWING NUMBER: LC-200069-001

CURRENT REVISION: A

LATEST REVISION: A

JOB NUMBER:

PSM: M

REVISION LEVEL: 1

CATEGORY:

CLASS:

SUBCLASS:

ITEM	COMPONENT PART NUMBER	DESCRIPTION	QUANTITY	UOM
001	LC-300100-001	SUPPORT, 2" VANEMAKER,	1.00	EA
002	LC-500533-001	SPROCKET, 50B13, REMACHINED	1.00	EA
003	200061-068	BUSHING, FLANGED,	1.00	EA
004	200040-063	WASHER, THRUST	1.00	EA
005	200013-003	COLLAR, SET SCREW	2.00	PC

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**SINGLE LINE BILL OF MATERIAL FOR
ASSEMBLY NUMBER: LC-200069-003
ASSEMBLY, 2" VANEMAKER,
SMALL CHAIN TOP IDLER**

DRAWING NUMBER: LC-200069-003

CURRENT REVISION: -

LATEST REVISION:

JOB NUMBER: PSM: M

REVISION LEVEL: -

CATEGORY: CLASS:

SUBCLASS:

ITEM	COMPONENT PART NUMBER	DESCRIPTION	QUANTITY	UOM
001	LC-300100-004	SUPPORT, 2" VANEMAKER,	1.00	EA
002	LC-500419-001	SPROCKET, 40B15 RE-MACHINED	1.00	EA
003	200013-003	COLLAR, SET SCREW	2.00	PC
004	200061-068	BUSHING, FLANGED,	1.00	EA
005	200040-044	WASHER, THRUST	1.00	EA
006	60021-5-6	SCREW, HEX HEAD CAP	2.00	EA

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SINGLE LINE BILL OF MATERIAL FOR
ASSEMBLY NUMBER: LC-200069-004
ASSEMBLY, 2" VANEMAKER, CHAIN IDLER

DRAWING NUMBER: LC-200069-004

CURRENT REVISION: -

LATEST REVISION:

JOB NUMBER: PSM: M

REVISION LEVEL: -

CATEGORY: BOM

CLASS:

SUBCLASS:

ITEM	COMPONENT PART NUMBER	DESCRIPTION	QUANTITY	UOM
001	LC-500418-003	BRACKET, IDLER SHAFT	2.00	EA
002	LC-500419-002	SPROCKET, 40B15 RE-MACHINED	1.00	EA
003	LC-500537-001	SHAFT, IDLER	1.00	EA
004	225053-110	PLUG, PIPE - HEX SOCKET	1.00	EA
005	60022-6	WASHER, PLAIN, TYPE "A", WIDE	2.00	EA
006	60024-6	WASHER, LOCK	2.00	EA
007	60033-6	NUT, HEX, RIGHT HAND COARSE THREAD,	2.00	EA
008	65650-6-40	SCREW, HEX HEAD CAP, FULL THREAD,	2.00	EA
009	200004-243	BEARING, STRAIGHT ROLLER,	1.00	EA
010	200035-045	RACE, INNER BEARING,	1.00	EA
011	200040-063	WASHER, THRUST	2.00	EA
012	200099-006	COLLAR, SPLIT	2.00	EA
013	225080-004	FITTING, GREASE,	1.00	PC

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**SINGLE LINE BILL OF MATERIAL FOR
ASSEMBLY NUMBER: LC-200070-001
BEARING BRACKET ASSEMBLY, LEFT
(BAB) 5/30/17 11/3/17B**

DRAWING NUMBER: LC-200070-001

CURRENT REVISION: C

LATEST REVISION: C

JOB NUMBER: PSM: S REVISION LEVEL: -

CATEGORY: MAN INVTRY CLASS: MAN IN SUBCLASS:

ITEM	COMPONENT PART NUMBER	DESCRIPTION	QUANTITY	UOM
001	LC-300095-001	BRACKET, HEM BEARING, LEFT	1.00	EA
002	LC-500404-001	SPACER, HEM BEARING I.D.	2.00	EA
003	200003-049	BEARING, BALL - SGL ROW RADIAL	1.00	EA
004	200003-166	BEARING, BALL - SGL ROW RADIAL	1.00	EA
005	60005-6-12	BOLT, CARRIAGE, STEEL,	2.00	EA
006	60022-6	WASHER, PLAIN, TYPE "A", WIDE	4.00	EA
007	60024-6	WASHER, LOCK	2.00	EA
008	60033-6	NUT, HEX, RIGHT HAND COARSE THREAD,	2.00	EA

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**SINGLE LINE BILL OF MATERIAL FOR
ASSEMBLY NUMBER: LC-200070-002
BEARING BRACKET ASSEMBLY, RIGHT
(BAB) 5/30/17 11/3/17B**

DRAWING NUMBER: LC-200070-002

CURRENT REVISION: B

LATEST REVISION: B

JOB NUMBER: PSM: S REVISION LEVEL: -

CATEGORY: MAN INVTRY CLASS: MAN IN SUBCLASS:

ITEM	COMPONENT PART NUMBER	DESCRIPTION	QUANTITY	UOM
001	LC-300095-002	BRACKET, HEM BEARING, RIGHT	1.00	EA
002	LC-500404-001	SPACER, HEM BEARING I.D.	2.00	EA
003	200003-049	BEARING, BALL - SGL ROW RADIAL	1.00	EA
004	200003-166	BEARING, BALL - SGL ROW RADIAL	1.00	EA
005	60005-6-12	BOLT, CARRIAGE, STEEL,	2.00	EA
006	60022-6	WASHER, PLAIN, TYPE "A", WIDE	4.00	EA
007	60024-6	WASHER, LOCK	2.00	EA
008	60033-6	NUT, HEX, RIGHT HAND COARSE THREAD,	2.00	EA

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**SINGLE LINE BILL OF MATERIAL FOR
ASSEMBLY NUMBER: LC-200071-001
UPPER MANDREL ASSEMBLY
(BAB) 5/30/17**

DRAWING NUMBER: LC-200071-001

CURRENT REVISION: -

LATEST REVISION:

JOB NUMBER:

PSM: S

REVISION LEVEL: -

CATEGORY: MAN INVTRY

CLASS: MAN IN

SUBCLASS:

ITEM	COMPONENT PART NUMBER	DESCRIPTION	QUANTITY	UOM
001	LC-300093-001	MANDREL, UPPER	1.00	EA
002	LC-300094-001	PLATE, INPUT GUIDE, RIGHT	1.00	EA
003	LC-300094-002	PLATE, INPUT GUIDE, LEFT	1.00	EA
004	LC-500390-001	BAR, SPACER	1.00	EA
005	60012-6-8	SCREW, SOCKET HEAD CAP VMI	4.00	EA
006	60024-6	WASHER, LOCK	4.00	EA

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**SINGLE LINE BILL OF MATERIAL FOR
ASSEMBLY NUMBER: LC-200072-001
FEED ROLL BRACKET ASSEMBLY, LEFT
(BAB) 5/30/17**

DRAWING NUMBER: LC-200072-001

CURRENT REVISION: -

LATEST REVISION:

JOB NUMBER: PSM: S

REVISION LEVEL: -

CATEGORY: MAN INVTRY

CLASS: MAN IN

SUBCLASS:

ITEM	COMPONENT PART NUMBER	DESCRIPTION	QUANTITY	UOM
001	LC-300102-001	BRACKET, FEED SPACER, LEFT	1.00	EA
002	LC-500364-001	ROLL, FEED SPACER	1.00	EA
003	LC-500384-001	BUSHING, FLANGED	1.00	EA

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**SINGLE LINE BILL OF MATERIAL FOR
ASSEMBLY NUMBER: LC-200073-001
STRAIGHTENING ROLL ASSEMBLY
(BAB) 5/30/17**

DRAWING NUMBER: LC-200073-001

CURRENT REVISION: -

LATEST REVISION:

JOB NUMBER:

PSM: S

REVISION LEVEL: -

CATEGORY: MAN INVTRY

CLASS: MAN IN

SUBCLASS:

ITEM	COMPONENT PART NUMBER	DESCRIPTION	QUANTITY	UOM
001	LC-500364-002	ROLL, STRAIGHTENING	1.00	EA
002	LC-500364-005	SHAFT, STRAIGHTENING ROLL	1.00	EA
003	200019-001	RING, RETAINING	2.00	PC
004	200081-001	BUSHING - BRONZE	2.00	EA

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**SINGLE LINE BILL OF MATERIAL FOR
ASSEMBLY NUMBER: LC-200074-001
GUIDE ROLL ASSEMBLY
(BAB) 5/30/17 10/31/17A**

DRAWING NUMBER: LC-200074-001

CURRENT REVISION: A

LATEST REVISION: A

JOB NUMBER: PSM: S REVISION LEVEL: -

CATEGORY: MAN INVTRY CLASS: MAN IN SUBCLASS:

ITEM	COMPONENT PART NUMBER	DESCRIPTION	QUANTITY	UOM
001	LC-500368-002	BAR, SPACER, GROOVES	1.00	EA
002	LC-500369-001	ROLL, GUIDE	1.00	EA
005	200064-003	RING, RETAINING	2.00	EA
006	200139-011	WASHER, THRUST	4.00	EA
007	200061-071	BUSHING, FLANGED, BRONZE	2.00	EA

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SINGLE LINE BILL OF MATERIAL FOR
ASSEMBLY NUMBER: LC-200085-003
ASSEMBLY, 2" VANEMAKER GUARDING
(PK) 11/15/17 6/27/18D

DRAWING NUMBER: LC-200085-003

CURRENT REVISION: D

LATEST REVISION: D

JOB NUMBER: PSM: M

REVISION LEVEL: -

CATEGORY: CLASS:

SUBCLASS:

ITEM	COMPONENT PART NUMBER	DESCRIPTION	QUANTITY	UOM
001	LC-300114-003	BRACKET, CONTROL CABINET/GUARD	1.00	EA
002	LC-300122-001	BRACKET, OPERATOR'S STATION,	1.00	EA
003	LC-500520-001	ANGLE, GUARD SUPPORT	1.00	EA
004	LC-300112-001	BRACKET, SAFETY SWITCH MOUNTING	1.00	EA
005	LC-500472-001	BAR, SAFETY SWITCH ACTUATOR	1.00	EA
006	LC-500472-003	BRACKET, SAFETY SWITCH MOUNTING	1.00	EA
007	LC-500472-002	BAR, SAFETY SWITCH ACTUATOR	1.00	EA
008	LC-600066-001	GUARD, SHEAR TOP & FLAPPER	1.00	EA
009	LC-600067-001	GUARD, SHEAR FRAME EXIT	1.00	EA
010	LC-600069-001	GUARD, 2" VANEMAKER FRAME,	2.00	EA
012	LC-600070-001	GUARD, 2" VANEMAKER, MILL MODULE	1.00	EA
015	LC-600078-001	GUARD, 2" VANEMAKER HINGED ACCESS	1.00	EA
017	LC-600080-001	GUARD, OPERATOR'S STATION COVER	1.00	EA
018	LC-600081-001	GUARD, SAFETY SWITCH COVER	1.00	EA
019	250017-384	SWITCH, SAFETY INTERLOCK, TONGUE	2.00	EA
020	60021-4-4	SCREW, HEX HEAD CAP	27.00	EA
021	60012-3-8	SCREW, SOCKET HEAD CAP	2.00	EA
022	60012-3-12	SCREW, SOCKET HEAD CAP	4.00	EA
023	60012-4-6	SCREW, SOCKET HEAD CAP	5.00	EA
024	60021-6-8	SCREW, HEX HEAD CAP	6.00	EA
026	60021-4-6	SCREW, HEX HEAD CAP	2.00	EA
027	60012-3-6	SCREW, SOCKET HEAD CAP	2.00	EA
028	60012-5-6	SCREW, SOCKET HEAD CAP -	8.00	EA
029	60008-4-3	SCREW, BUTTON HEAD SOCKET CAP	2.00	EA
030	60021-6-6	SCREW, HEX HEAD CAP	1.00	EA
031	60033-6	NUT, HEX, RIGHT HAND COARSE THREAD,	6.00	EA
032	60022-4	WASHER, PLAIN, TYPE "A", WIDE VMI	11.00	EA
033	60024-4	WASHER, LOCK, HELICAL-SPRING, REGUL	6.00	EA
034	61243-6	NUT, LOCKING, FLANGED, STEEL PLATED,	2.00	EA
035	60022-6	WASHER, PLAIN, TYPE "A", WIDE	2.00	EA

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**SINGLE LINE BILL OF MATERIAL FOR
ASSEMBLY NUMBER: LC-200085-003
ASSEMBLY, 2" VANEMAKER GUARDING
(PK) 11/15/17 6/27/18D**

DRAWING NUMBER: LC-200085-003

CURRENT REVISION: D

LATEST REVISION: D

JOB NUMBER: PSM: M

REVISION LEVEL: -

CATEGORY: CLASS:

SUBCLASS:

ITEM	COMPONENT PART NUMBER	DESCRIPTION	QUANTITY	UOM
036	60024-6	WASHER, LOCK	2.00	EA
039	60185-4	NUT, CLAMPING, 1/4"-20,UNISTRUT P-1006-	1.00	EA
040	225091-093	STICKER, SAFETY, ISO, 3" DIAMETER	3.00	EA
041	225091-062	STICKER,SAFETY,DO NOT OPERATE W/O GUARD	5.00	EA
042	225091-049	STICKER, SAFETY, ISO "HAND CRUSH/ROLLER	1.00	EA
043	225091-082	STICKER, SAFETY	1.00	EA
044	225091-042	STICKER, SAFETY, ISO "HAND	2.00	EA
045	225091-091	STICKER, SAFETY	2.00	EA
046	225091-051	STICKER, SAFETY, ISO "HAND CRUSH/FORCE	1.00	EA
047	225091-046	STICKER, SAFETY, ISO "FINGER OR HAND	1.00	EA

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**SINGLE LINE BILL OF MATERIAL FOR
ASSEMBLY NUMBER: YD-700003-001
SAFETY STICKERS, 240VAC ELECTRICAL
ENCLOSURE
AMB (9-11-09), 1/30/14**

DRAWING NUMBER:

CURRENT REVISION: A

LATEST REVISION: A

JOB NUMBER:

PSM: M

REVISION LEVEL:

CATEGORY: BOM

CLASS:

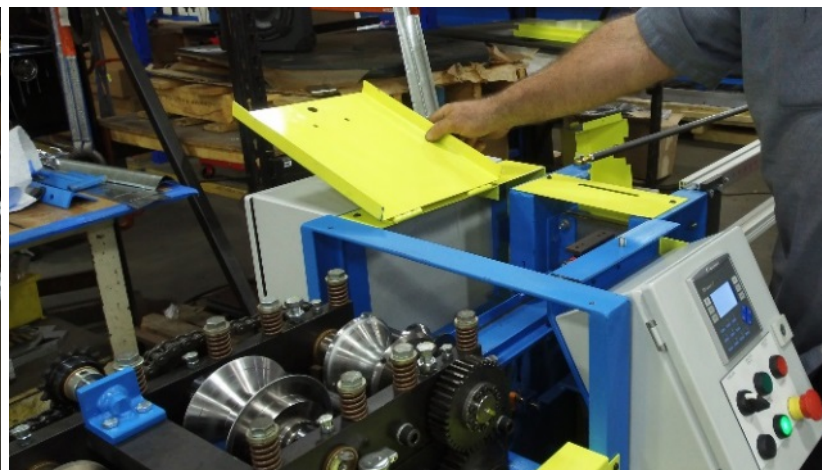
SUBCLASS:

ITEM	COMPONENT PART NUMBER	DESCRIPTION	QUANTITY	UOM
001	225091-094	STICKER,SAFETY,ISO, "240 VOLTS"	1.00	EA
002	225091-096	STICKER,SAFETY,ISO, "DANGER HAZARDOUS	1.00	EA
003	225091-097	STICKER,SAFETY,ISO, "WARNING HAZARDOUS	1.00	EA
004	225091-098	STICKER,SAFETY,ISO, "WARNING HAZARDOUS	1.00	EA
005	225091-099	STICKER,SAFETY,ISO, "WARNING ARC FLASH"	1.00	EA
006	225091-024	STICKER, SAFETY -	1.00	EA
007	225091-055	STICKER, SAFETY, ISO "ELECTRICAL	5.00	EA

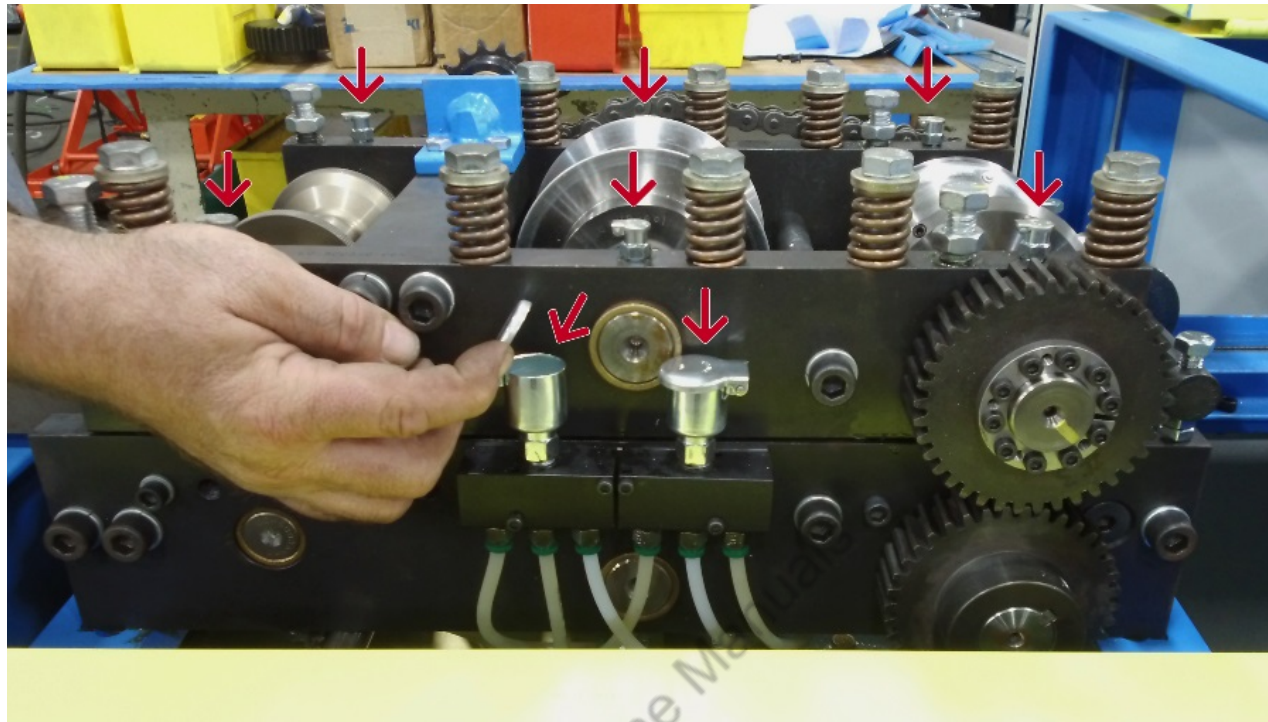
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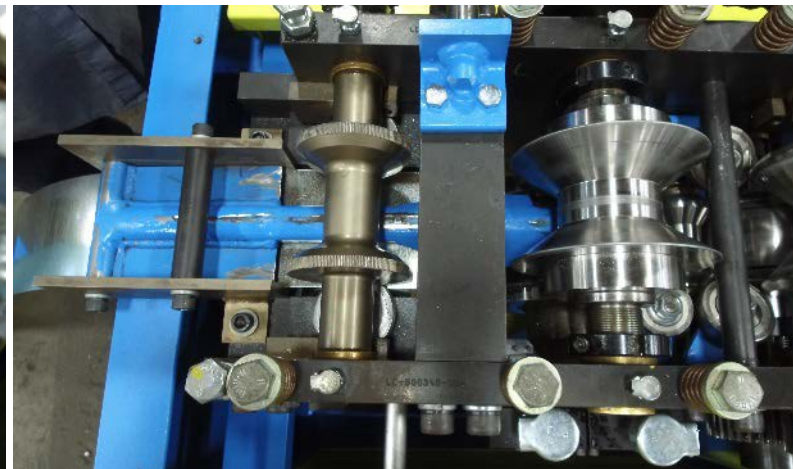
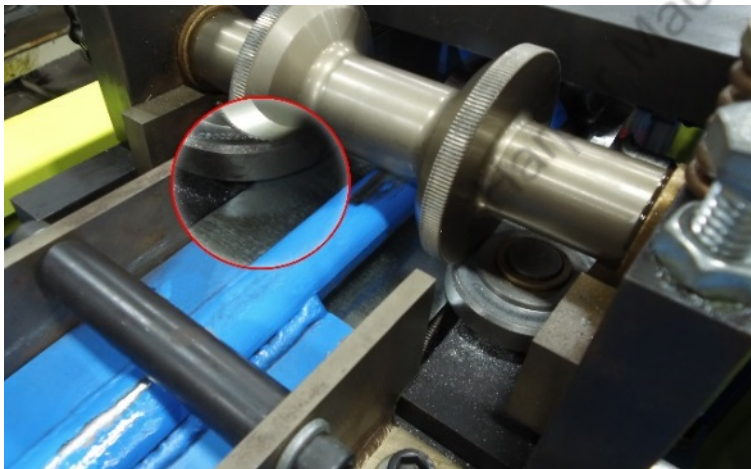
1. Thread material from coils under tensioner roll (clean or cut away any tape residue or damaged material, square up ends).



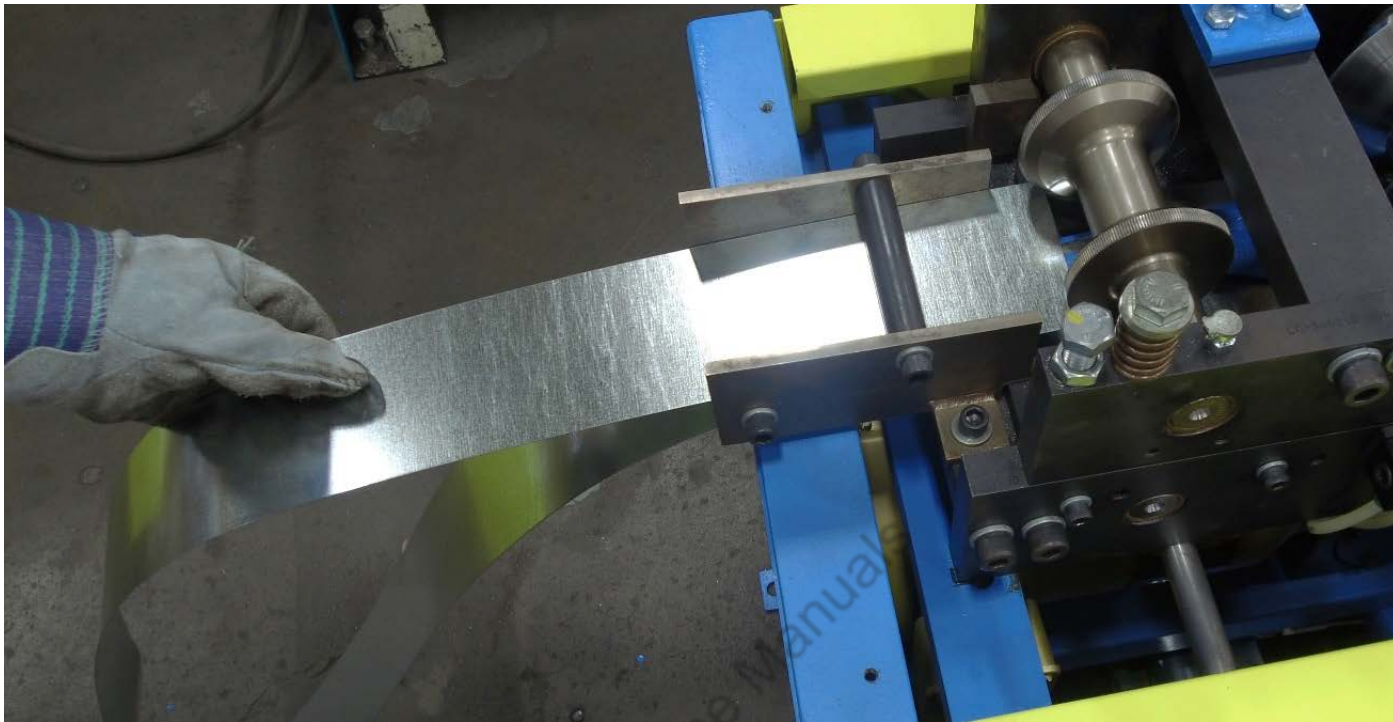
2. Remove hinged access door. When the access door is open, the machine will only operate in jog mode.



3. Check that all eight (8) oilers are regularly filled (30w oil is recommended). The machine ships with all fluids already added.



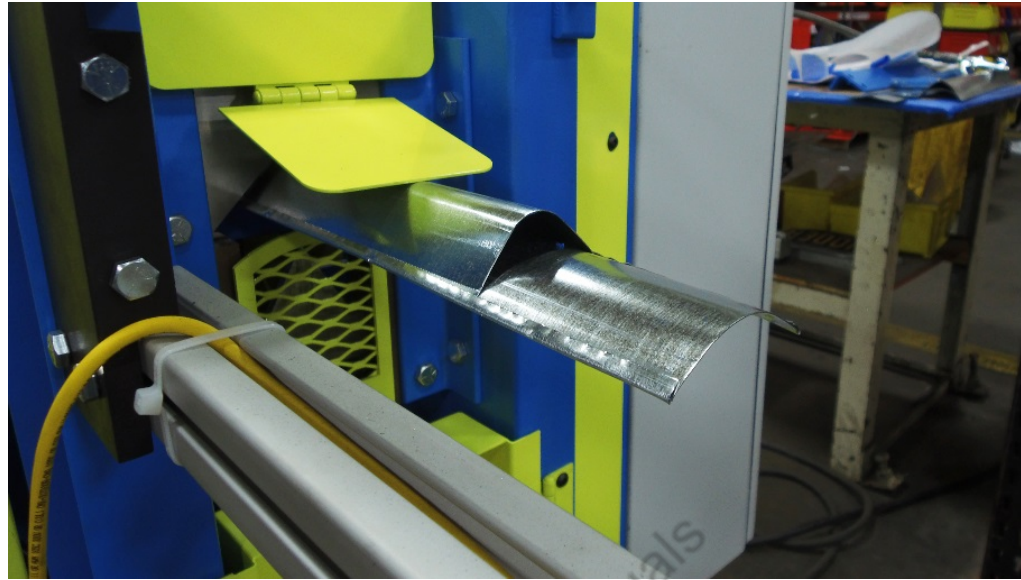
4. Manually insert only the bottom material.
 - a. Make sure to slide it in underneath the side rollers and past the feed rollers 3"-4".



5. Manually insert top material until it contacts and wedges slightly under the upper feed roll.



6. Turn the main cabinet power on. Then, select jog mode (right) and press control power on (the indicator will light up green).



7. Tap the jog button so that the material will feed in slowly.
 - a. Continue to tap the jog button slowly, watching for material jamming while it travels through the rollers and out past the shear.



8. Replace the top guard, then close and secure access door with nut.



9. Set the length guage to 24"-30".
 - a. Select run mode and press the master start button. The part will trigger the length guage switch, the machine will stop and will engage the shear to cut the part.



10. Set the desired length of parts (may need to adjust up to 1/4").
 - a. Enter the quantity, press the ENTER button and the cursor will flash, enter the desired number of pieces, press ENTER again and the cursor will stop flashing.
 - b. Press the master start button. The machine will continuously start, stop and shear the parts until the quantity is met. Master Stop or E-Stop Button can be pushed at any time to shut the machine down immediately.