



C190

PARTS MANUAL

Note: When ordering any parts, please verify the Machine Model and Serial number found on the inside corner of the Load / Sprag wall side (See page 2 of the plaque example).

This will help our Parts Department to deliver the correct part.

Baysek

m a c h i n e s
I N C O R P O R A T E D

www.baysek.com

Ph 715-824-5300 Fax 715-824-5354
3261 County Hwy Q, Nelsonville, WI 54458 U.S.A.
e-mail: sales@baysek.com



Model No. _____

Serial No. _____

Date of Mfg. _____

Rated Voltage	Maximum Amps
_____	_____

Frequency _____

Short Circuit Current Rating _____

Misc. _____

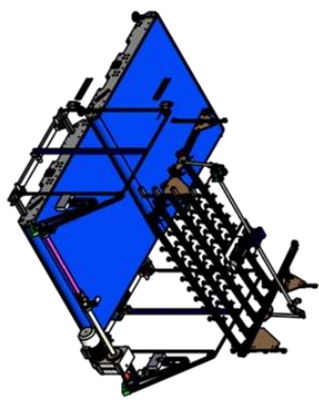
Mfg. to Specifications At _____

Note: The plaque with the actual Model and Serial Number scribed can be typically found on the inside corner of the Load / Sprag wall.

BAYSEK C190 (Cheat Sheet)

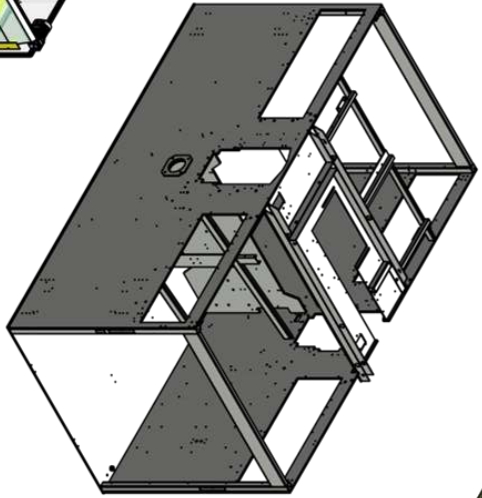
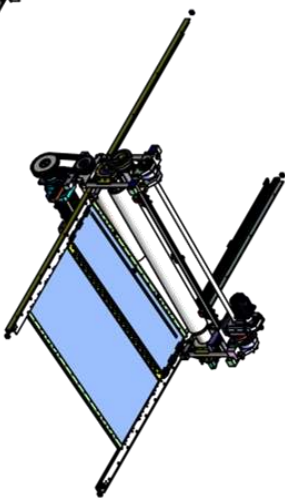
Unload Side

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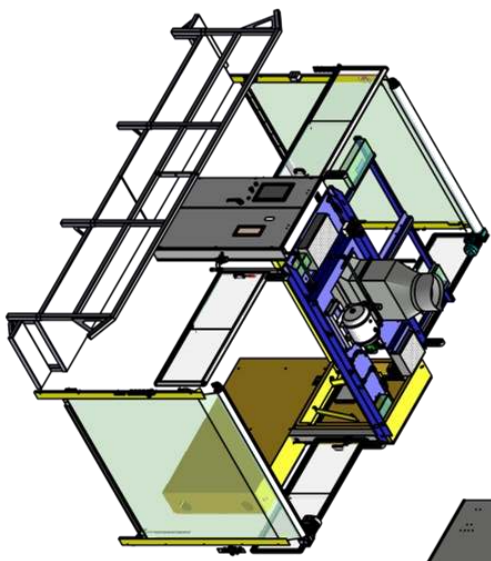
Bed / Roller Assembly

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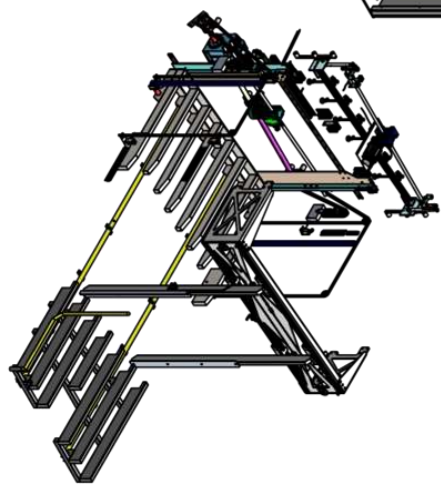
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Load Side

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The information contained within this manual is to the best of our knowledge correct at the time of publication. However, it is our policy to continually research, refine and improve all of the products produced by Baysek Machines Incorporated, therefore we reserve the right to alter design and specifications as we see fit, without notification.

Errors & omissions accepted

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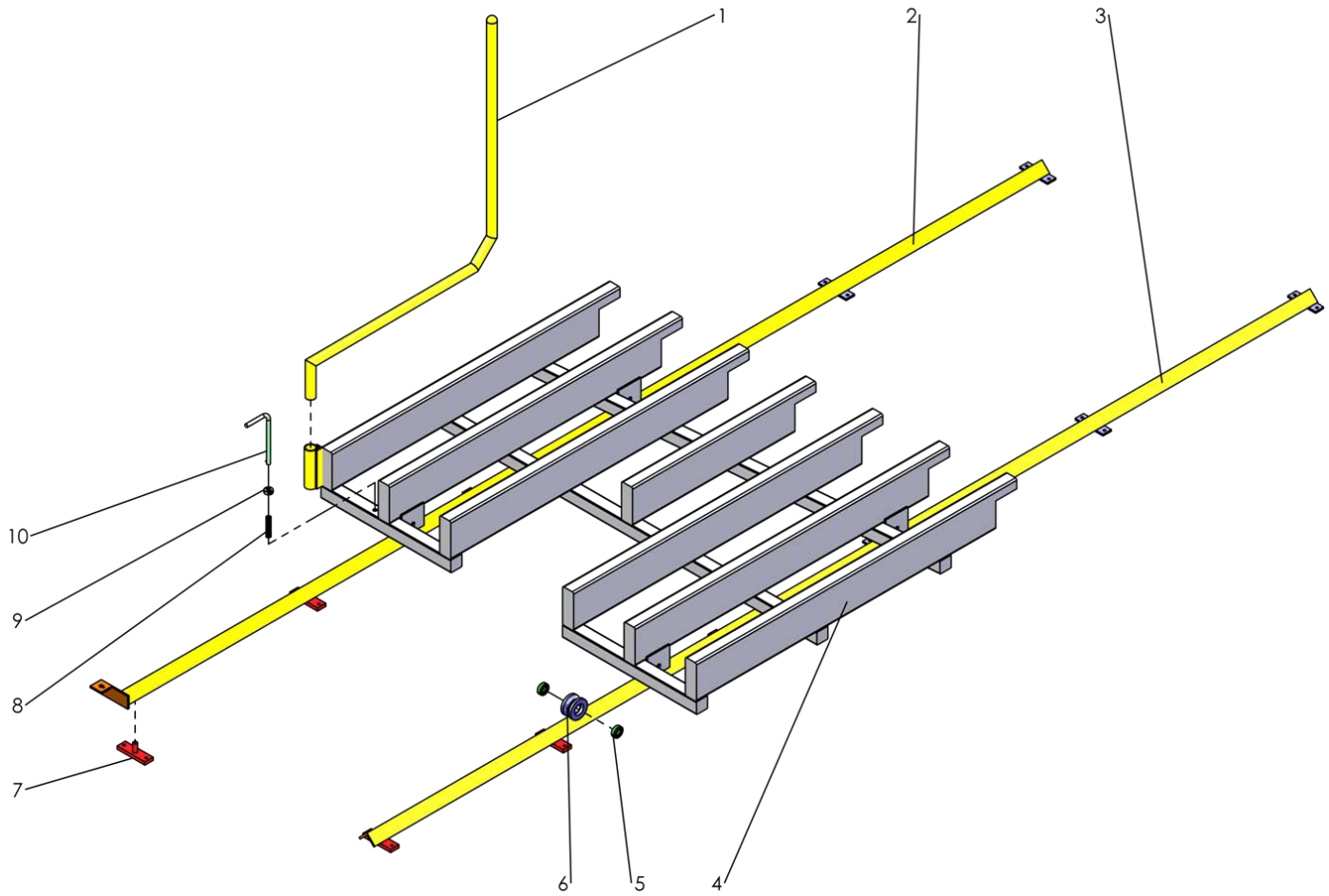
Supplement

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- Baysek Consumable Parts
- Die Board Rack System

Load Side

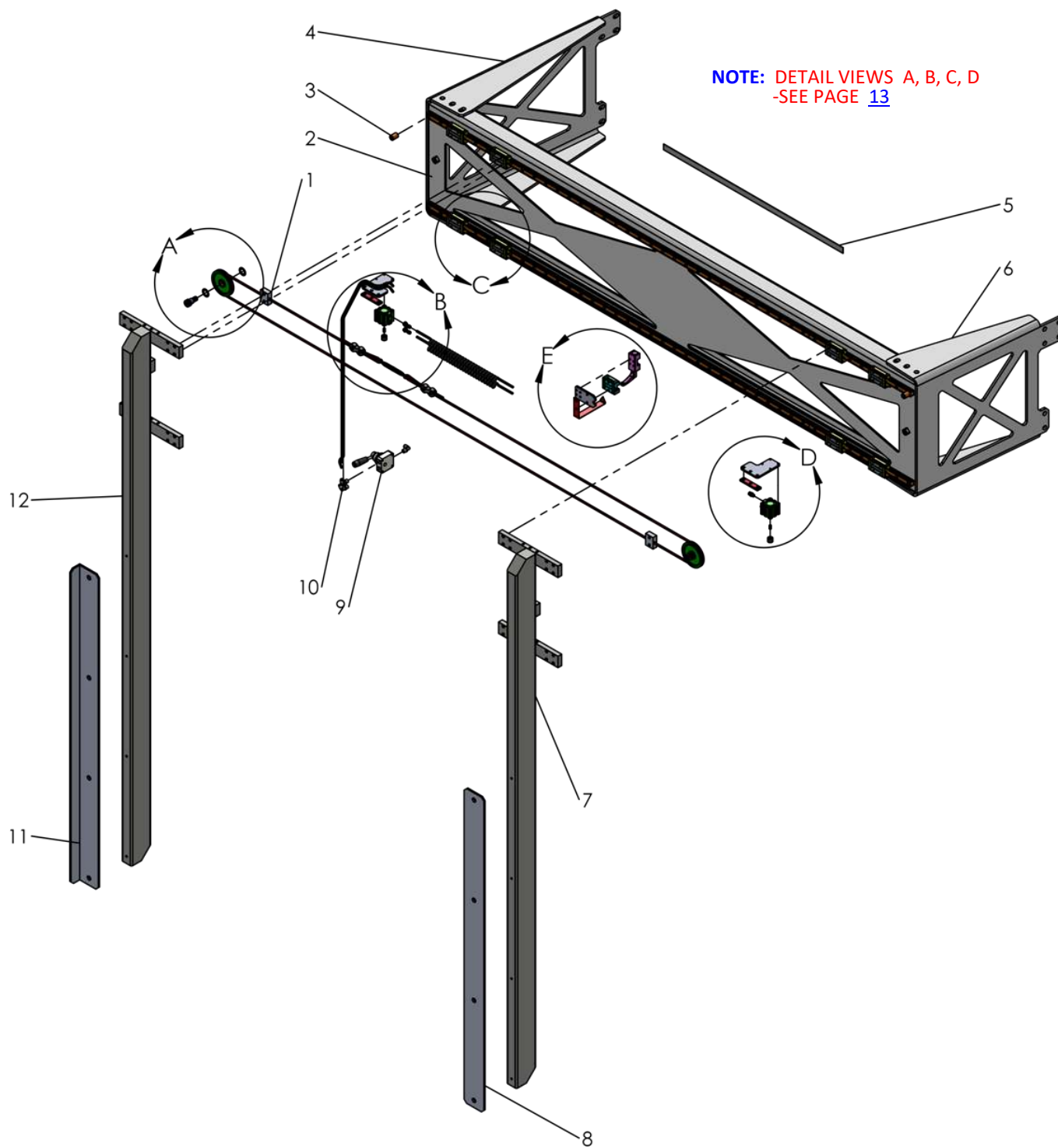
PRELOAD TROLLEY DETAIL				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	4000-066	HANDLE - TROLLEY		1
2	7000-308	ANGLE - TROLLEY TRACK - OPERATOR SIDE	TR05	1
3	7000-309	ANGLE - TROLLEY TRACK - SPRAG SIDE	TR06	1
4	9000-068	FRAME - TROLLEY PLATFORM	TR01, TR02	1
5	4500-158	BEARING - TROLLEY WHEEL	MCS# 6384K77	8
6	9000-069	WHEEL - TROLLEY, V	TR-03	4
7	7000-310	PLATE - TROLLEY TRACK FOOT	TR09	6
8	7600-064	SPRING - LOCKING HANDLE	MCS# 9657K452	1
9	4500-222	COLLAR - SHAFT CLAMP	MCS# 6436K14	1
10	4000-067	HANDLE - TROLLEY LOCKING		1

PRELOAD TROLLEY DETAIL



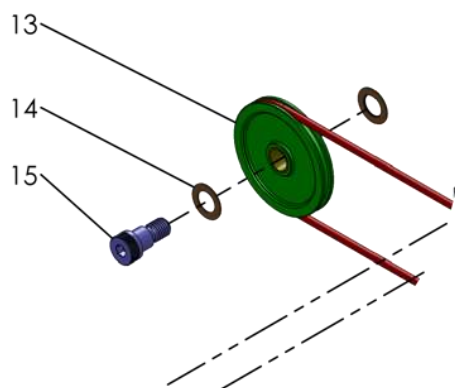
STANDARD PRELOAD GATE DETAIL				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	7000-341	CLAMP - PRELOAD GATE CABLE	GATE-6	2
2	7000-696	FRAME - PRELOAD GATE, FRONT		1
3	2000-072	STOP - PILE GUIDE BEARING		2
4	7000-698	FRAME - PRELOAD GATE, OPERATOR SIDE		1
5	7600-049	SCALE - LEFT-TO-RIGHT (HALF SCALE)	MCS# 19425A42	1
6	7000-697	FRAME - PRELOAD GATE, SPRAG SIDE		1
7	7000-337	POST - PILE GUIDE, SPRAG SIDE		1
8	7000-338	PLATE - PILE GUIDE, SPRAG SIDE	GT02-A	1
9	7600-033	VALVE - DIRECTIONAL, 2 POSITION	SMC# VH202-02 - 2 POSITION	1
10	3500-307	ELBOW - 6mm X 1/4 RPT	SMC# KQ2L06-02AS	3
11	7000-339	ANGLE - PILE GUIDE, OPERATOR SIDE	GR02-B	1
12	7000-340	POST - PILE GUIDE, OPERATOR SIDE		1

STANDARD PRELOAD GATE - DETAIL

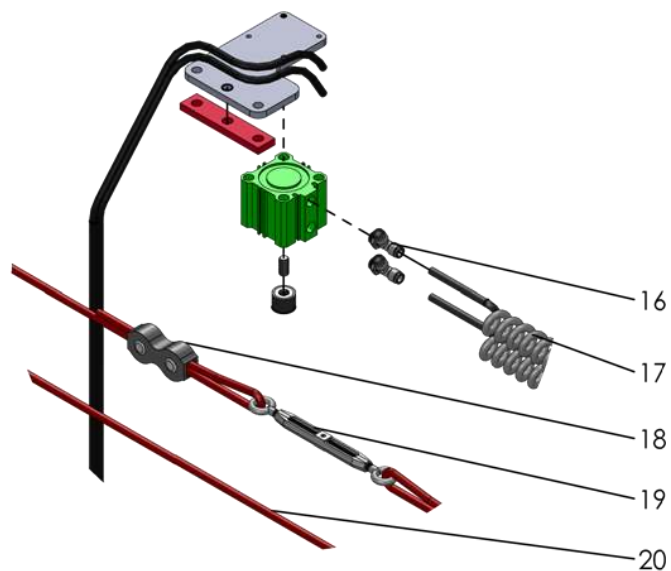


PRELOAD GATE DETAIL VIEWS				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
13	4000-055	PULLY - PRELOAD GATE	MCS# 9466T65	2
14	2000-073	WASHER - 0.75in ID X 1.0in OD X 0.062in	MCS# 91124A111	4
15	1000-541	SCREW - 0.75in X 0.625in - .625-11in THREAD, SHOULDER	FC# 26274	2
16	3500-312	TEE - 6mm X 6mm X 1/8 RPT, BRANCH	SMC# KQ2T06-01AS	2
17	6500-021	TUBING - 6mm, COIL	SMC# TCU0604B-1	5
18	7000-213	CLAMP - TWO BOLT CABLE	MCS# 3677T55	2
19	4200-018	TURN BUCKLE - PRELOAD GATE	MCS# 30315T52	1
20	8600-025	CABLE - 0.25in OD ROPE, NEW VERSION	MCS# 8912T536	1
21	4500-047	BEARING - SSR25 LINEAR	THK# SSR25XW1SS[GK]	8
22	3000-065	RAIL - SR25 X 2480mm	THK# SR25 X 2480 RAIL	2
23	7000-699	PLATE - CYLINDER MOUNT		2
24	2000-155	SPACER - GATE BRAKE		2
25	3500-304	STRAIGHT - 6mm X 1/8 RPT	SMC# KQ2H06-01AS	2
26	4200-019	CYLINDER - COMPACT	SMC# CQ2B40-15DZ	2
27	1000-600	ROD - M8 X 1.25P X 16mm FULLY THREADED	MCS# 93805A350	2
28	4200-029	BUMPER - CYLINDER LOCKING	MCS# 9546K216	2
29	4500-273	BRAKE - HAND LOCKING	ZIMMER# HK2501A	1
30	4500-274	BEARING - HAND LOCKING	THK# SSR25XV1SS	1
31	7000-701	PLATE - ADAPTER WIDTH STOP		1
32	7000-702	INDICATOR- POSITION		1

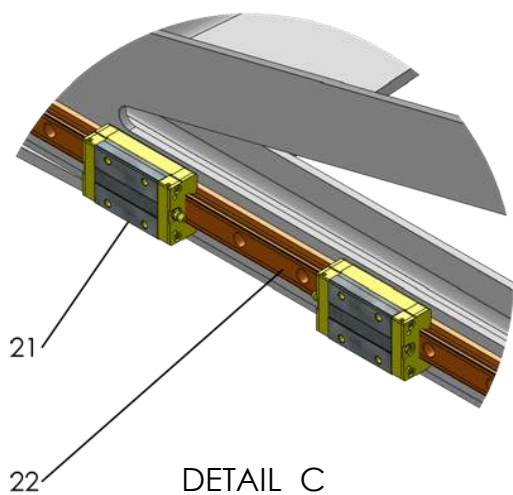
PRELOAD GATE DETAIL VIEWS



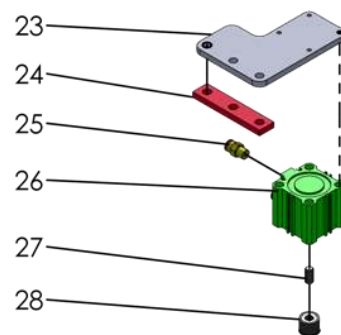
DETAIL A



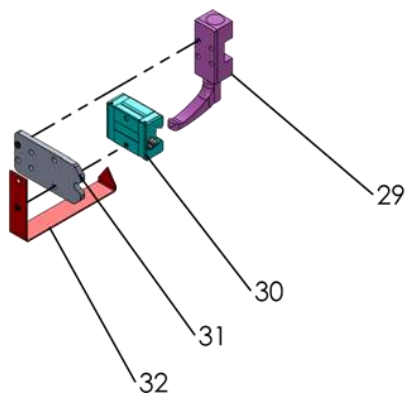
DETAIL B



DETAIL C

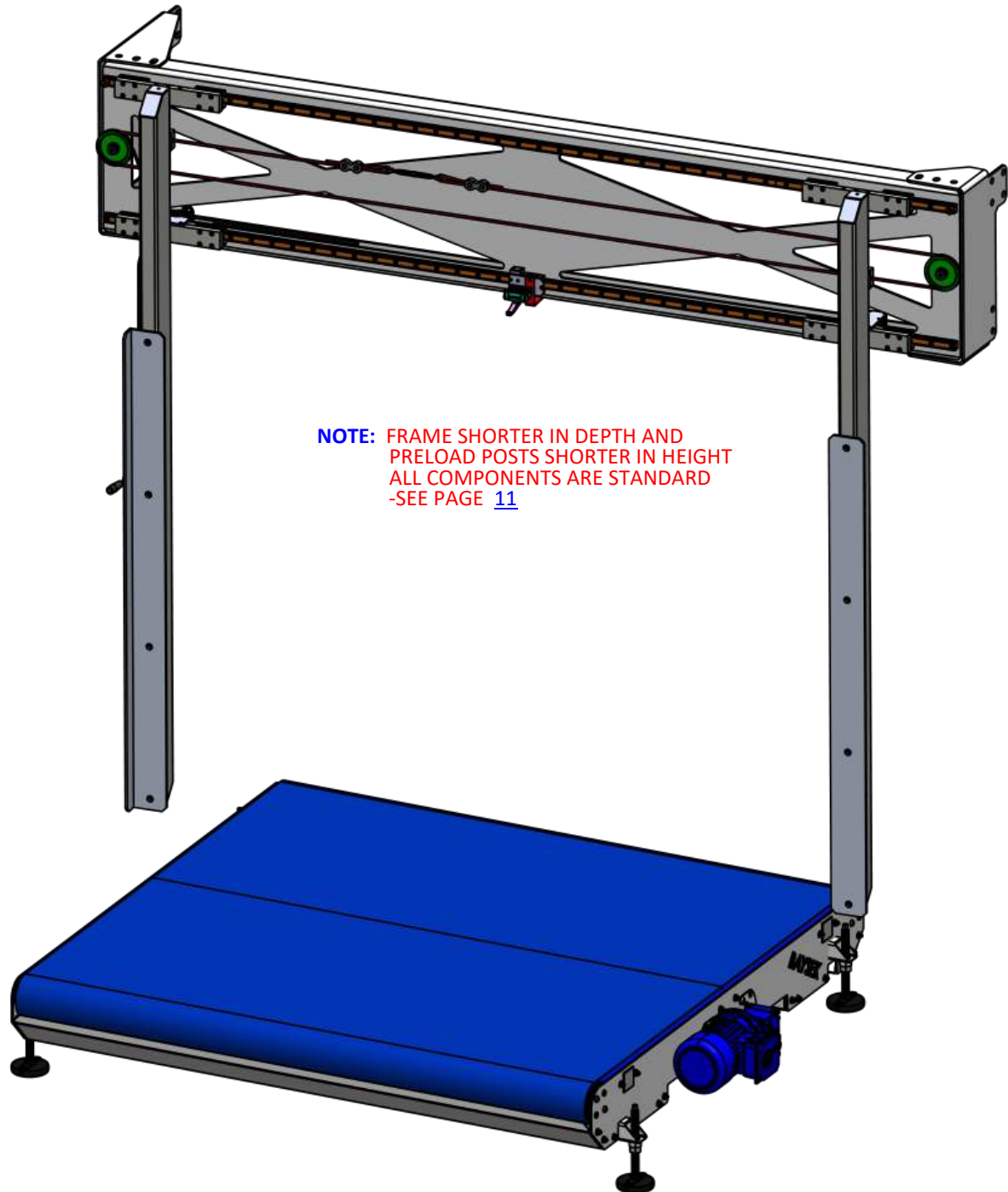


DETAIL D



DETAIL E

INFEED CONVEYOR WITH PRELOAD (OPTIONAL) (AUTOLOAD)



NOTE: FRAME SHORTER IN DEPTH AND
PRELOAD POSTS SHORTER IN HEIGHT
ALL COMPONENTS ARE STANDARD
-SEE PAGE [11](#)

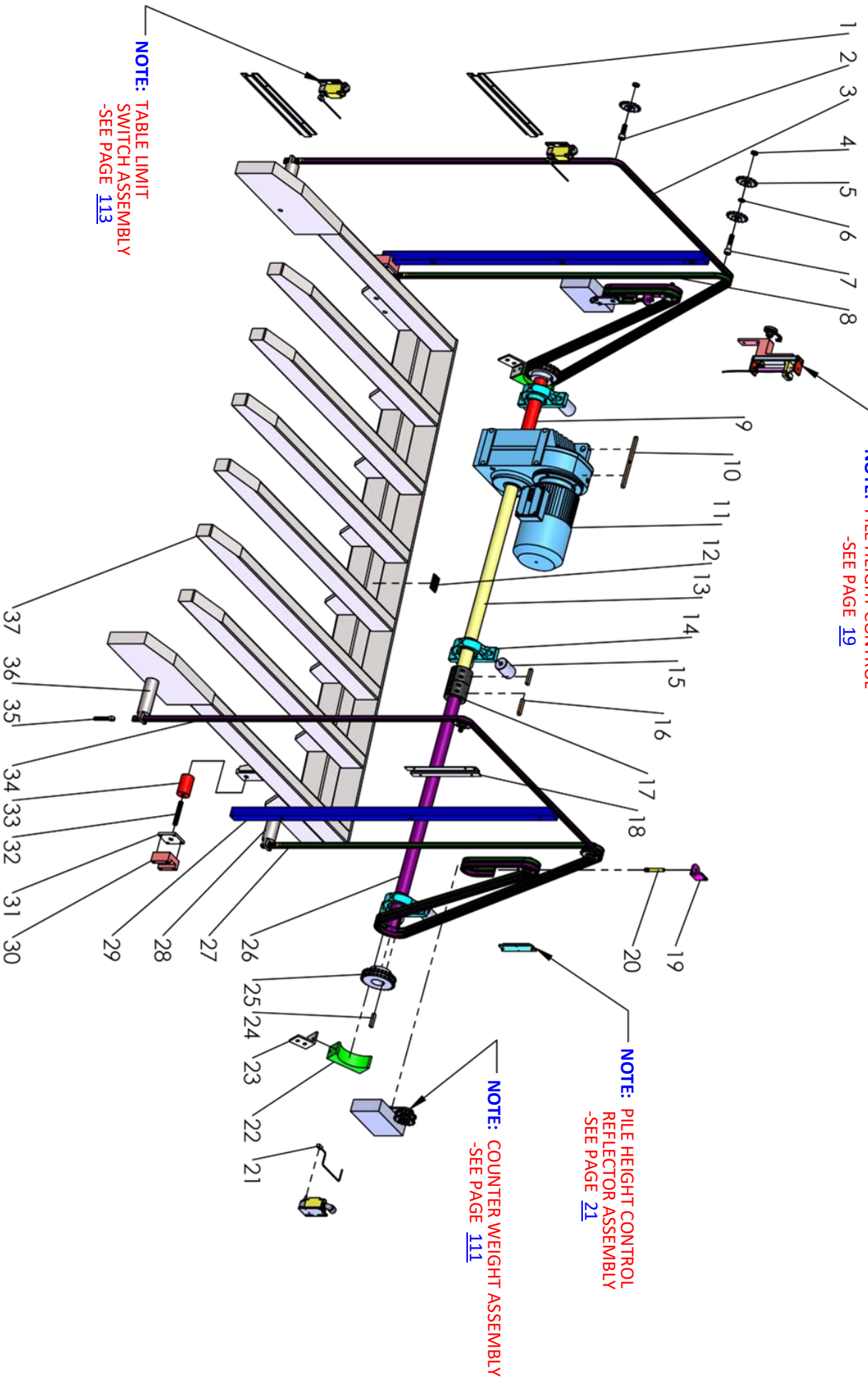
NOTE: CONVEYOR CENTER DRIVE DETAIL
-SEE PAGE [127](#)

LOAD LIFT TABLE DETAIL				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	8600-070	COVER - WIRE	80/20# 25-8611-4M (CUT TO LENGTH (PER PRINT)	2
2	M16-45-SH	SCREW - M16 X 2.0P X 45mm SHCS	MCS# 91290A815	2
3	5000-067	CHAIN - LIFT 1	50 RIV ROLLER CHAIN X 264in	1
4	7000-945	SPACER - SG SPROCKET - IDLER		6
5	4500-300	SPROCKET - IDLER ROLLER CHAIN	BDI# 621213 - M/G 50BB15H	10
6	7000-944	SPACER - DOUBLE SPROCKET IDLER		4
7	M16-65-SH	SCREW - M16 X 2.0P X 65MM SHCS	MCS# 91290A835	4
8	5000-063	CHAIN - LIFT 2	50 RIV ROLLER CHAIN X 201in	1
9	3000-104	SHAFT - LIFT 1	LT-06	1
10	2500-064	KEY - 9mm X 14mm X 101mm		2
11	7500-031	MOTOR - LIFT TABLE	SEW# FA77BDR90L4/BE2HR	1
12	8501-051	REFLECTOR - OMRON	BC# OMRON - E39-R1	3
13	3000-105	SHAFT - LIFT 2	LT-07	1
14	4500-159	BEARING - 50mm ID, PILLOW BLOCK	PTI# UCP210 SOLID BASE PIL BLK	3
15	2000-079	STANDOFF - 50mm OD X 77.8mm LONG	LT09	6
16	2500-063	KEY - 9mm X 14mm X 60mm		2
17	4500-216	COUPLING - 50mm ID	WBT# 2MISCC-50-50-KW	1
18	8600-068	COVER - WIRE, LASER	80/20# 25-8611-4M (CUT TO LENGTH (PER PRINT)	1
19	7000-274	BRACKET - COUNTERWEIGHT MOUNT	MP7-A	2
20	1000-452	BOLT - M12 X1.75P X 90mm, CONNECTING, DBL	LT02-B	2
21	8501-141	LEVER - WIRE LIMIT TRIP, BEND	CHAIN WEIGHT LIMIT	1
22	5000-052	BLOCK - CHAIN KEEPER	LT8-A	2
23	7000-356	BRACKET - CHAIN KEEPER	MP3-A	2
24	2500-065	KEY - 9mm X 14mm X 50mm		2
25	4500-211	SPROCKET - DRIVE	EGI# DS50B25 PER DWG LT05	2
26	3000-106	SHAFT - LIFT 3	LT-08	1
27	5000-065	CHAIN - LIFT 3	50 RIV ROLLER CHAIN X 205in	1
28	2000-083	STANDOFF - LIFT (REAR)	IFC_011; 50mm X 155mm CHROME; LT-11	2
29	2000-088	BAR - VERTICAL GUIDE	LT-19	2
30	7000-090C	BLOCK - GUIDE	LT-17	2
31	7000-355	PLATE - GUIDE BLOCK	LT-18	2
32	2500-068	ROD - M16 X 2.0P X 100mm, READY THREAD	MCS# 99067A133	2
33	2000-084	STANDOFF - GUIDE BLOCK	LT4-A	2
34	5000-066	CHAIN - LIFT 4	50 RIV ROLLER CHAIN X 262in	1
35	1000-448	BOLT - M12 X1.75P X 90mm, CONNECTING	LT02	5
36	2000-085	STANDOFF - LIFT (FRONT)	LT-10	2
37	7000-366	FRAME - LOAD LIFT		1

LOAD LIFT TABLE DETAIL

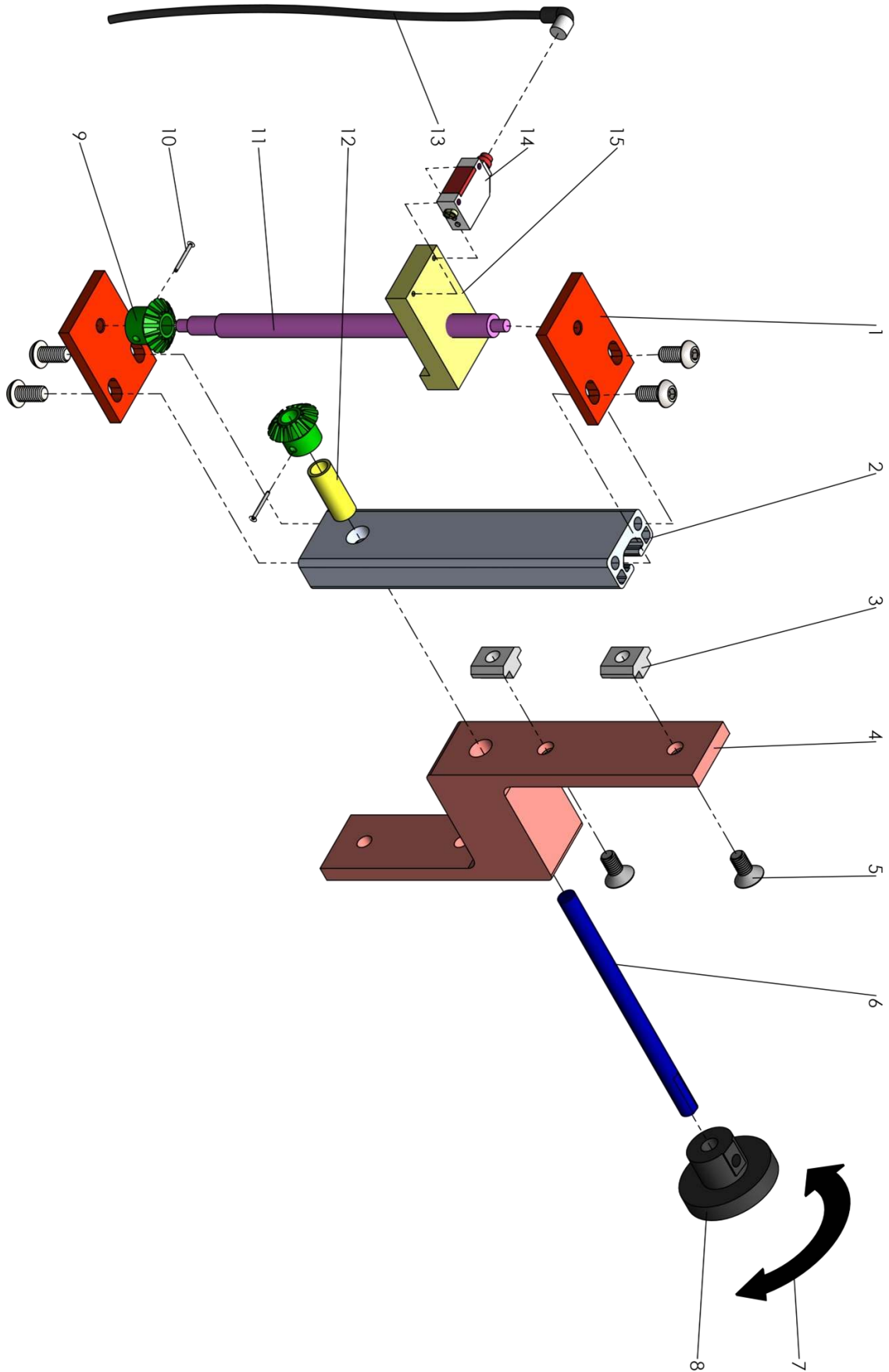
9500-054

NOTE: PILE HEIGHT CONTROL
-SEE PAGE 19



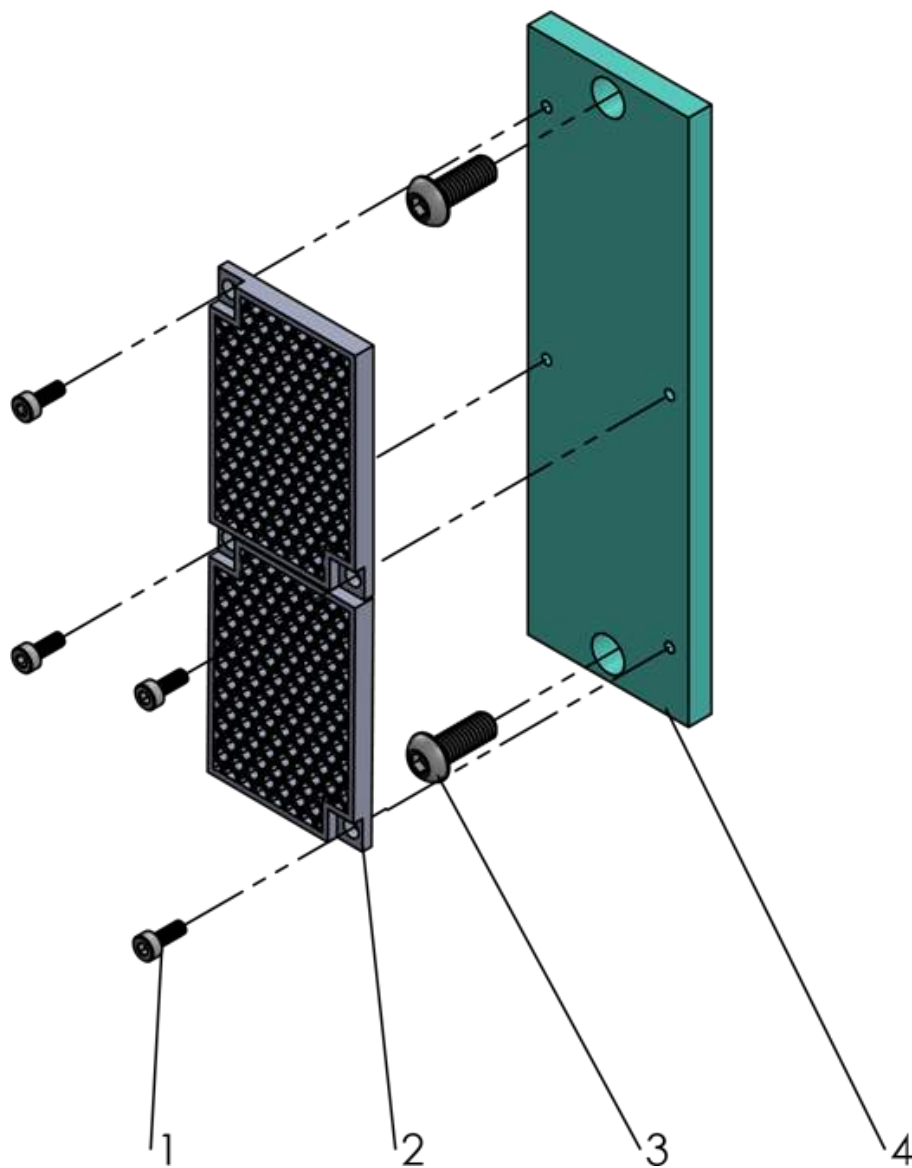
PILE HEIGHT CONTROL ASSEMBLY #9500-054				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	7000-241	PLATE - PILE HEIGHT		2
2	3000-082	BAR - 80/20 PILE HEIGHT	80/20# 40-4020 X 190.5mm	1
3	1500-071	M14-NYL - M8 X 1.25P SLIDE IN T-NUT W/ BALL SPRING	80/20# 40-13025	2
4	7000-242	BRACKET - PILE HEIGHT		1
5	M8-18-FH	SCREW - M8 X 1.25P X 18mm FHCS	MCS# 91294A283	2
6	3000-081	SHAFT - PILE HEIGHT		1
7	8000-014	DECAL - HAND KNOB		1
8	4000-062	KNOB - ADJUSTMENT	MCS# 6333K8	1
9	M8-16-BH	SCREW - M8 X 1.25P X 16mm BHCS	MCS# 91239A418	4
10	4500-182	GEAR - MITER GEAR	MCS# 7297K18	2
11	2500-044	PIN - 0.0625in X 0.75in LONG, ROLL	MCS# 98296A035	2
12	1000-459	SCREW - PILE HEIGHT		1
13	4500-183	BUSHING - 3/8in ID X 1/2in OD X 1.25in LONG, SLEEVE	MCS# 6391K179	1
14	8501-073	CABLE - PHOTO EYE SENSOR	BBTI# PHOENIX - 1406242	1
15	8501-048	SENSOR - PHOTO EYE	BBTI# SENSOPART - 606-11008-FR 25-R-PS-M4M	1
16	7000-243	BLOCK - ADJUSTMENT		1

PILE HEIGHT CONTROL ASSEMBLY



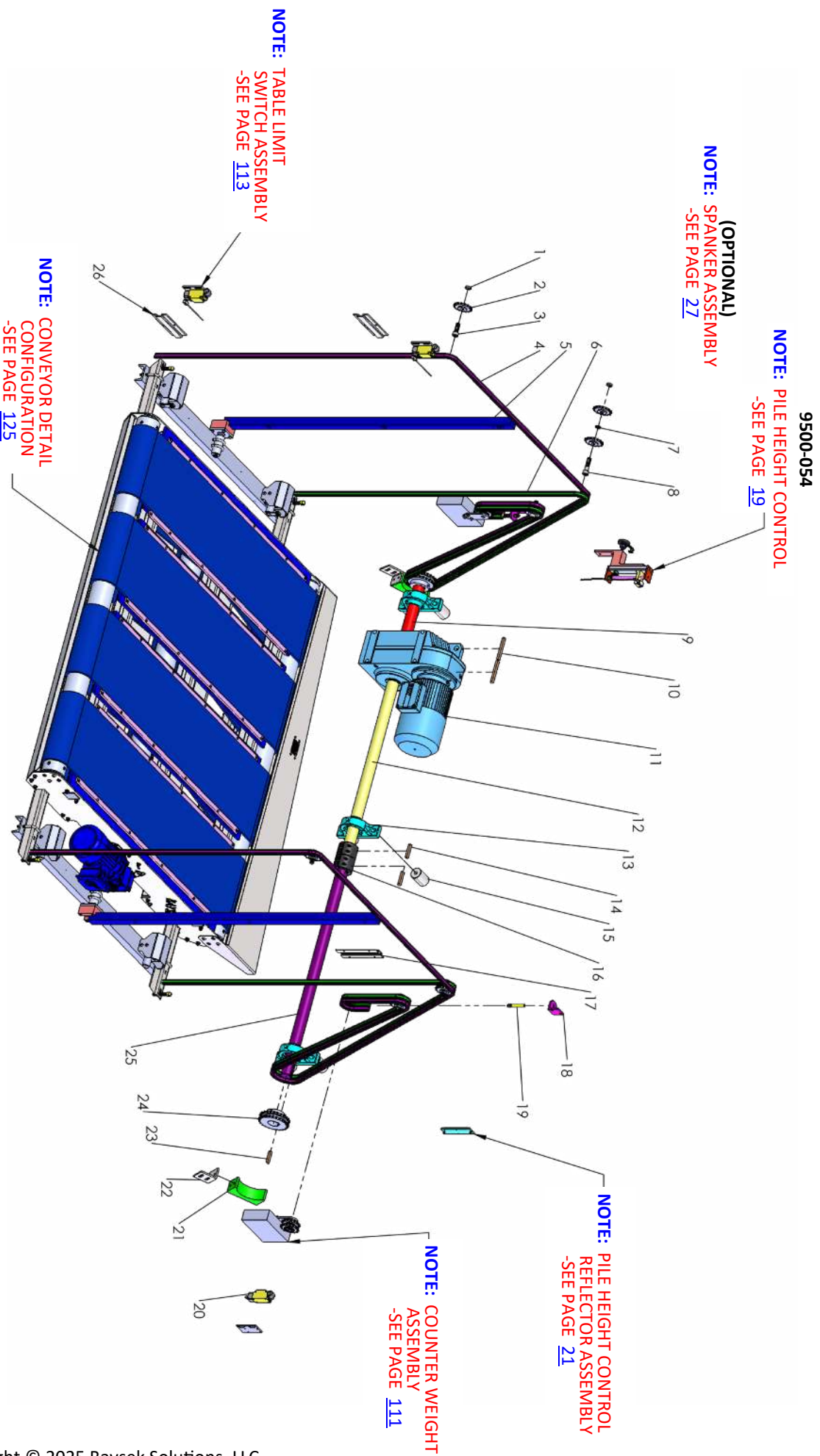
PILE HEIGHT REFLECTOR ASSEMBLY #9500-077				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	M3-8-SH	SCREW - M3 X 0.5P X 8mm SHCS	MCS# 91292A112	4
2	8501-051	REFLECTOR - OMRON	BC# OMRON - E39-R1	2
3	M6-16-BH	SCREW - M6 X 1.0P X 16mm BHCS	MCS# 91239A321	2
4	7000-252	PLATE - DUAL REFLECTOR		1

PILE HEIGHT REFLECTOR ASSEMBLY



AUTO LOAD CONVEYOR (OPTIONAL)				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	7000-945	SPACER - SG SPROCKET - IDLER		6
2	4500-300	SPROCKET - IDLER ROLLER CHAIN	BDI# 621213 - M/G 50BB15H	10
3	M16-45-SH	SCREW - M16 X 2.0P X 45mm SHCS	MCS# 91290A815	2
4	5000-077	CHAIN - LIFT 1	50 RIV ROLLER CHAIN X 246in	2
5	2000-088	BAR - VERTICAL GUIDE	LT-19	2
6	5000-078	CHAIN - LIFT 2	50 RIV ROLLER CHAIN X 198in	2
7	7000-944	SPACER - DOUBLE SPROCKET IDLER		4
8	M16-65-SH	SCREW - M16 X 2.0P X 65MM SHCS	MCS# 91290A835	4
9	3000-104	SHAFT - LIFT 1	LT-06	1
10	2500-064	KEY - 9mm X 14mm X 101mm		2
11	7500-031	MOTOR - LIFT TABLE	SEW# FA77BDR90L4/BE2HR	1
12	3000-105	SHAFT - LIFT 2	LT-07	1
13	4500-159	BEARING - 50mm ID, PILLOW BLOCK	PTI# UCP210 SOLID BASE PIL BLK	3
14	2500-063	KEY - 9mm X 14mm X 60mm		2
15	2000-079	STANDOFF - 50mm OD X 77.8mm LONG	LT09	6
16	4500-216	COUPLING - 50mm ID	WBT# 2MISCC-50-50-KW	1
17	10463	COVER - WIRE, LASER	80/20# 25-8611-4M (CUT TO LENGTH (PER PRINT)	1
18	7000-274	BRACKET - COUNTERWEIGHT MOUNT	MP7-A	2
19	1000-452	BOLT - M12 X1.75P X 90mm, CONNECTING, DBL	LT02-B	2
20	10162	SWITCH - LIMIT WITH PLUNGER ACTUATOR	OMRON D4B-4171N-NPT	1
21	5000-052	BLOCK - CHAIN KEEPER	LT8-A	2
22	7000-356	BRACKET - CHAIN KEEPER	MP3-A	2
23	2500-065	KEY - 9mm X 14mm X 50mm		2
24	4500-211	SPROCKET - DRIVE	EGI# DS50B25 PER DWG LT05	2
25	3000-106	SHAFT - LIFT 3	LT-08	1
26	10370	COVER - WIRE	80/20# 25-8611-4M (CUT TO LENGTH (PER PRINT)	1

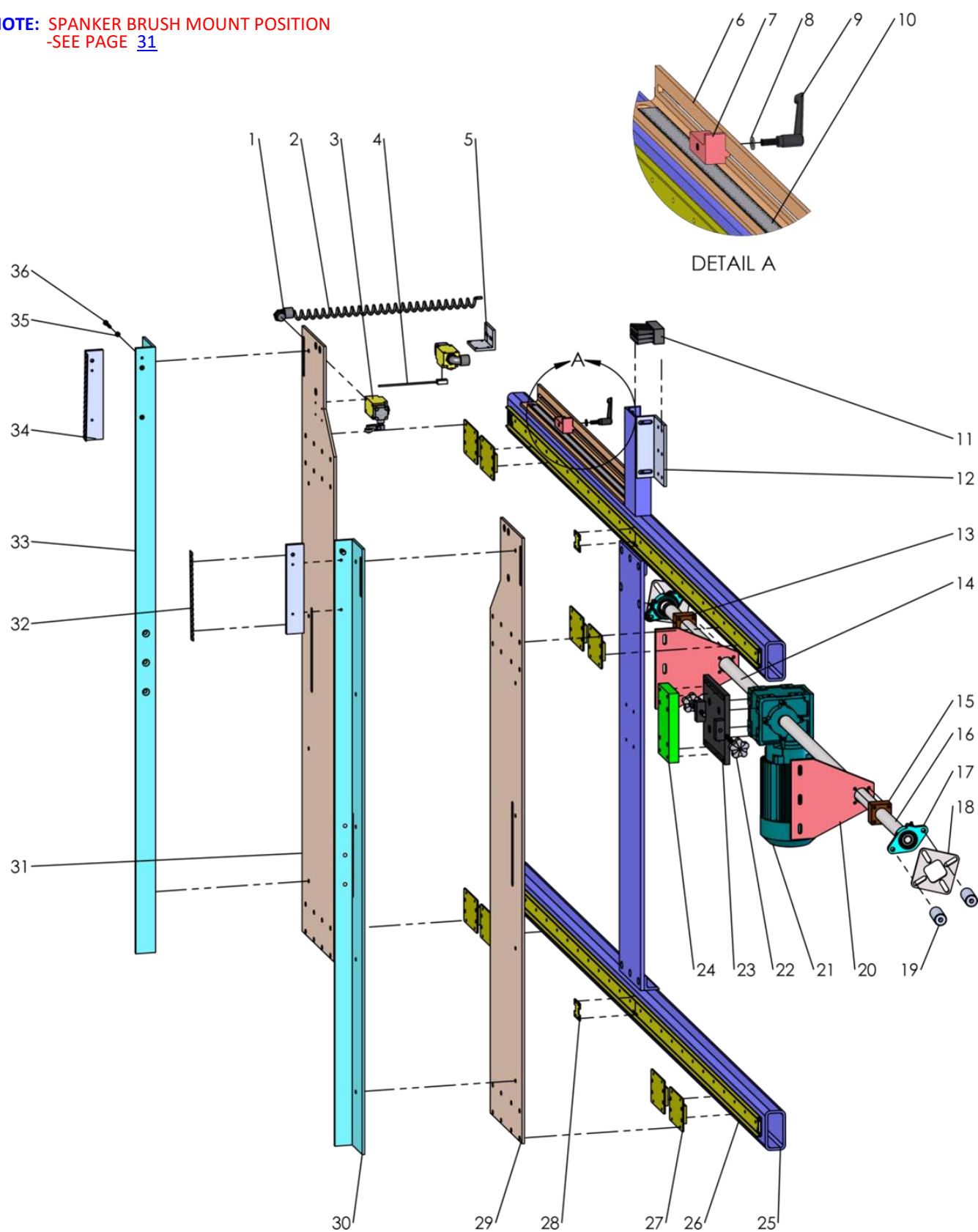
AUTO LOAD CONVEYOR (OPTIONAL)



CARD GUIDE DETAIL				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	8600-069	ELBOW - 0.25-0.38in X 1/2 KO, CABLE GRIP	MCS# 7466K411	2
2	8600-065A	CABLE - RETRACTABLE CORD	AUT# 24237P-36 ... (CUT IN HALF)	1
3	8501-052	SWITCH - LIMIT	BC# OMRON - D4B-4111N-NPT	2
4	8501-095	LEVER - WIRE LIMIT TRIP, STG	BC# OMRON - D4A-D00	1
5	7000-471	BRACKET - CARD GUIDE LIMIT SWITCH		1
6	7000-331	ANGLE - LIMIT SLIDE	CG7-A	1
7	7000-264	BLOCK - LIMIT GUIDE	CG3-A	1
8	M8-WAS	WASHER - M8	MCS# 91166A270	1
9	4000-050	HANDLE - M8 X 1.25P X 20mm, ADJUSTABLE	MCS# 60235K76	1
10	7600-050	SCALE - RIGHT TO LEFT (HALF SCALE)	MCS# 19425A45	1
11	10430	BRUSH - CARD SEPARATOR, SMALL	BMC# 3619 00	2
12	7000-211	BRACKET - CARD BRUSH MOUNT		2
13	1500-046	NUT - LEAD SCREW (LH)	CG-06	1
14	3000-095	SHAFT - SCREW, OPERATOR SIDE	CG-02; MCS# 98935A530 ACME ROD 1.25in-5	1
15	1500-045	NUT - LEAD SCREW (RH)	CG-07	1
16	3000-096	SHAFT - SCREW, SPRAG SIDE	CG-01; MCS# 98935A131 ACME ROD 1.25in-5	1
17	4500-167	BEARING - 20mm ID, FLANGE	PTI# UCFL204-20	2
18	10173	PLATE - ADAPTOR BEARING		2
19	2000-076	STANDOFF - SCREW SHAFT	CG-03	4
20	7000-315	PLATE - LEAD SCREW NUT	CG-08	2
21	7500-027	MOTOR - CARD GUIDE	SEW# WA30DRS71M4BE1HR	1
22	4000-068A	KNOB - M10 X 1.5P W/ 80mm STUD, STAR	MCS# 62015K312 W/ MCS# 99055A130	2
23	7000-349	PLATE - CARD GUIDE ADJUSTING	CG-05	1
24	7000-351	PLATE - MOTOR MOUNT	CG-04	1
25	7000-364	FRAME - CARD GUIDE		1
26	3000-066	RAIL - FBW 5011 X 1200mm	THK# FBW 50110R X 1200 RAIL	4
27	4500-157	BEARING - CARD GUIDE, LINEAR	THK# FBW 50110RUU SLIDER	8
28	7000-220	PLATE - CARD GUIDE, JOINT	THK# FBW 50110 JOINT	2
29	7000-448	PLATE - CARD GUIDE, SPRAG SIDE		1
30	7000-353	ANGLE - CARD GUIDE, SPRAG SIDE	CG-11	1
31	7000-447	PLATE - CARD GUIDE, OPERATOR SIDE		1
32	3000-016	BLADE - STRIPPER	PTRON# 4PT 970 STRAIGHT NOTCHED ROTARY	2
33	7000-354	ANGLE - CARD GUIDE, OPERATOR SIDE	CG-12	1
34	7000-325	BRACKET - STRIPPER	CG4-A	2
35	M6-NYL	NUT - M6 X 1.0P NYLOC	MCS# 90591A151	4
36	M6-40-HH	SCREW - M6 X 1.0P X 40mm HHC	MCS# 91280A342	4

CARD GUIDE DETAIL

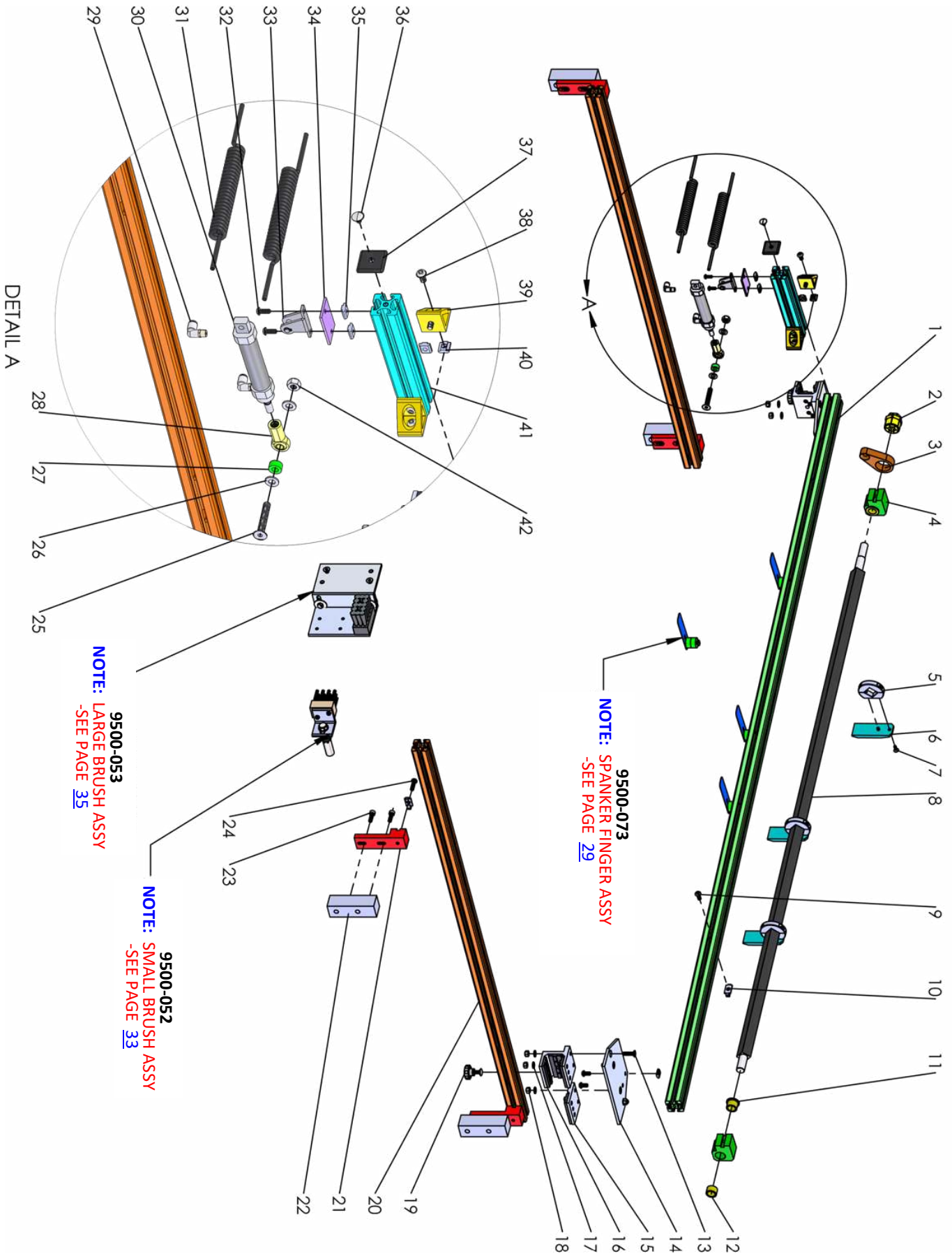
NOTE: SPANKER BRUSH MOUNT POSITION
-SEE PAGE [31](#)



SHEET SPANKER ASSEMBLY #9500-049 (OPTIONAL)				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	3000-074	BAR - SPANKER	80/20# 40-4040 X 2302mm	1
2	4500-179	BUSHING - KEYLESS TRANTORQUE	6202805 TRANTORQUE	1
3	3000-078	LINKAGE - SPANKER SHAFT		1
4	3000-076	BEARING - BLOCK, SPANKER SHAFT		2
5	4500-178	COLLAR - SPANKER SHAFT	MCS# 3325K21	3
6	7000-228	PLATE - SPANKER		3
7	M6-16-FH	SCREW - M6 X 1.0P X 16 FHCS	MCS# 91294A238	6
8	3000-077	SHAFT - SPANKER		1
9	M8-20-BH	SCREW - M8 X 1.25P X 20mm BHCS	MCS# 91239A426	2
10	1500-055	NUT - BOWTIE	80/20# 40-3679	6
11	4500-176	BUSHING - 20mm ID X 26mm OD X 20mm LONG, FLANGE	MCS# 6659K44	2
12	4500-177	BUSHING - 20mm ID X 26mm OD X 16mm LONG, SLEEVE	MCS# 6658K45	2
13	M8-30-FH	SCREW - M8 X 1.25P X 30 FHCS	MCS# 91294A287	6
14	10287	PLATE - BEARING		1
15	10288	BEARING - SINGLE FLANGE LINEAR		1
16	4500-175	BEARING - SINGLE FLANGE LINEAR	80/20# 40-6515 WITH HOLE	2
17	M8-WAS	WASHER - M8	MCS# 91166A270	6
18	M8 NYL	NUT - M8 X 1.25P NYLOC	MCS# 90576A117	10
19	4000-060	HANDLE - TEE	80/20# 40-6801	2
20	3000-073	BAR - SPANKER MOUNTING	80/20# 40-4040 X 1300mm	2
21	7000-225	BRACKET - SPANKER MOUNTING		4
22	2000-045	SPACER - STAND OFF, SPANKER		4
23	M8-25-SH	SCREW - M8 X 1.25P X 25mm SHSC	MCS# 91290A432	8
24	M8-30-BH	SCREW - M8 X 1.25P X 30mm BHSC	MCS# 91239A428	4
25	M10-60-FH	SCREW - M10 X 1.5P X 60mm FHCS	MCS# 91294A339	1
26	M10-WAS	WASHER - M10	MCS# 91166A280	2
27	2000-041	SPACER - 0.75in OD X 0.50in LONG	MCS# 94639A834	1
28	4500-163	JOINT - ROD END	SMC# KJ10DM10X1.25	1
29	3500-306	ELBOW - 6mm X 1/8 RPT	SMC# KQ2L06-01AS	2
30	4200-025	CYLINDER - AIR	SMC# CM2E25-75Z	1
31	6500-021	TUBING - 6mm, COIL	SMC# TCU0604B-1	2
+32	M6-16-BH	SCREW - M6 X 1.0P X 16mm BHCS	MCS# 91239A321	2
33	4200-024	BRACKET - CYLINDER	SMC# CM-E020B	1
34	7000-229	PLATE - STEEL		1
35	1500-053	NUT - M6 X 1.0P SLIDE IN T-NUT	80/20# 40-13024	2
36	1000-456	PIN - PUSH IN	80/20# 40-3274	1
37	3500-042	CAP - END, PLASTIC	80/20# 40-2030	1
*38	M8-16-BH	SCREW - M8 X 1.25P X 16mm BHCS	MCS# 91239A418	8
39	7000-227	BRACKET - CORNER GUSSET	80/20# 40-4332	2
40	1500-071	NUT - M8 X 1.25P SLIDE IN T-NUT W/ BALL SPRING	80/20# 40-13025	8
41	3000-075	BAR - CYLINDER	80/20# 40-4040 LITE X 225mm	1
42	M10 NYL	NUT - M10 X 1.5P NYLOC	MCS# 90576A118	1

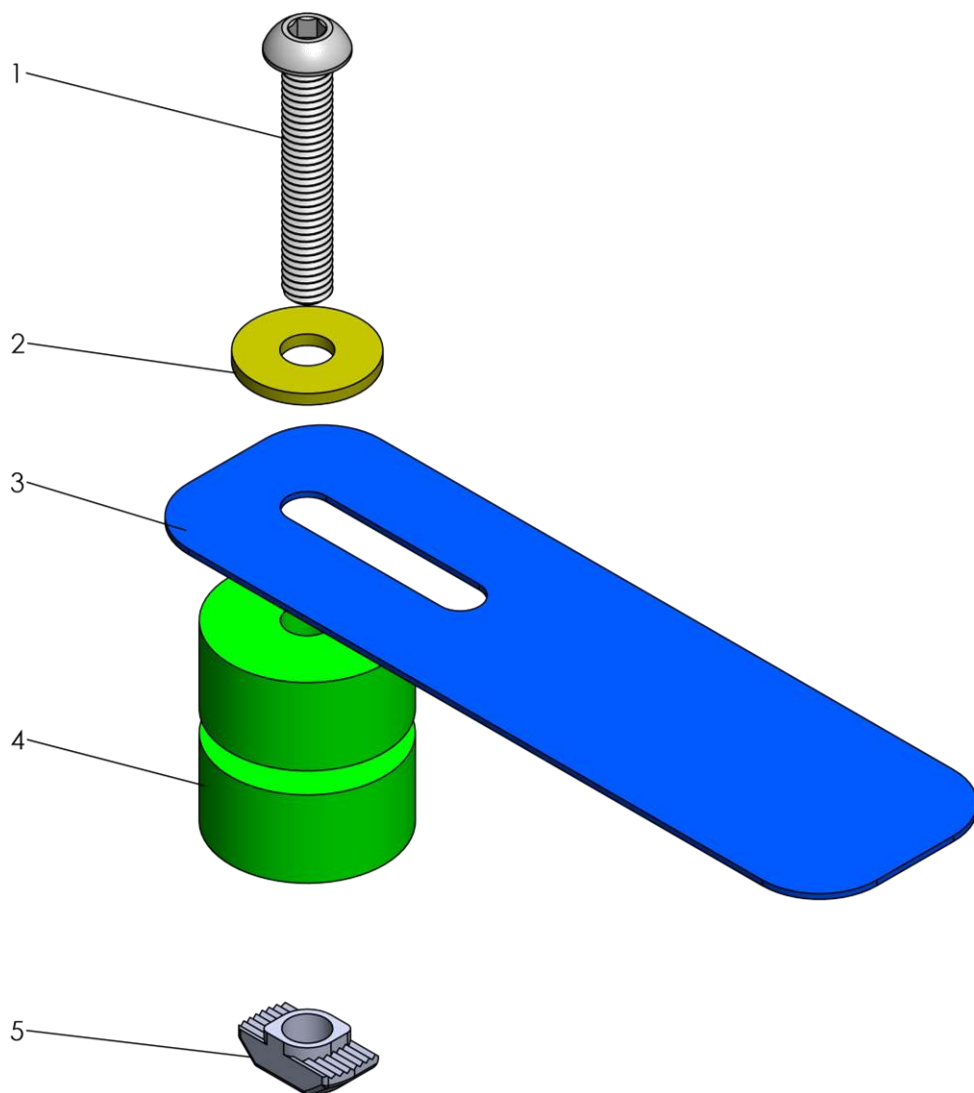
+ OPT	M6-20-BH	SCREW - M6 X 1.0P X 20mm BHCS	MCS# 91239A326	2
	M6-SPL	WASHER - M6 SPLIT LOCK	MCS# 91202A234	2
* OPT	M8-20-BH	SCREW - M8 X 1.25P X 20mm BHCS	MCS# 91239A426	8
	M8-SPL	WASHER - M8 SPLIT LOCK	MCS# 91202A230	8

SHEET SPANKER ASSEMBLY (OPTIONAL)



SPANKER FINGER ASSEMBLY #9500-073				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	M6-35-BH	SCREW - M6 X 1.0P X 35mm BHCS	MCS# 91239A330	1
2	2000-048	WASHER - M6	MCS# 91166A250	1
3	7000-261	PLATE - GUIDE, FINGER		1
4	2000-047	SPACER - 1.0in OD X 0.50in LONG		2
5	1500-052	NUT - M6 X 1.0P DROP IN, TWIST T-NUT	80/20# 40-13119	1

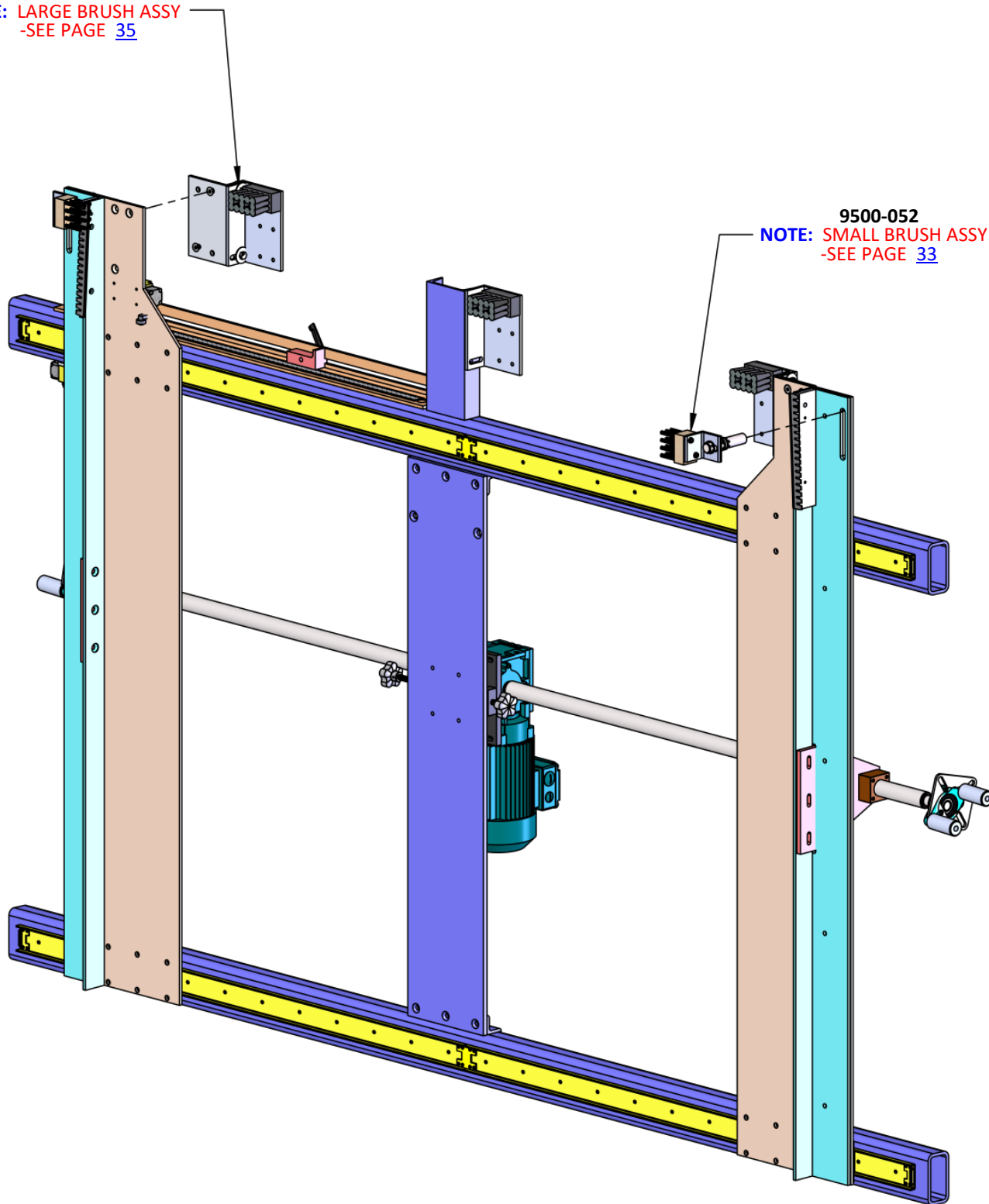
SPANKER FINGER ASSEMBLY



SPANKER BRUSH MOUNT POSITION (OPTIONAL)

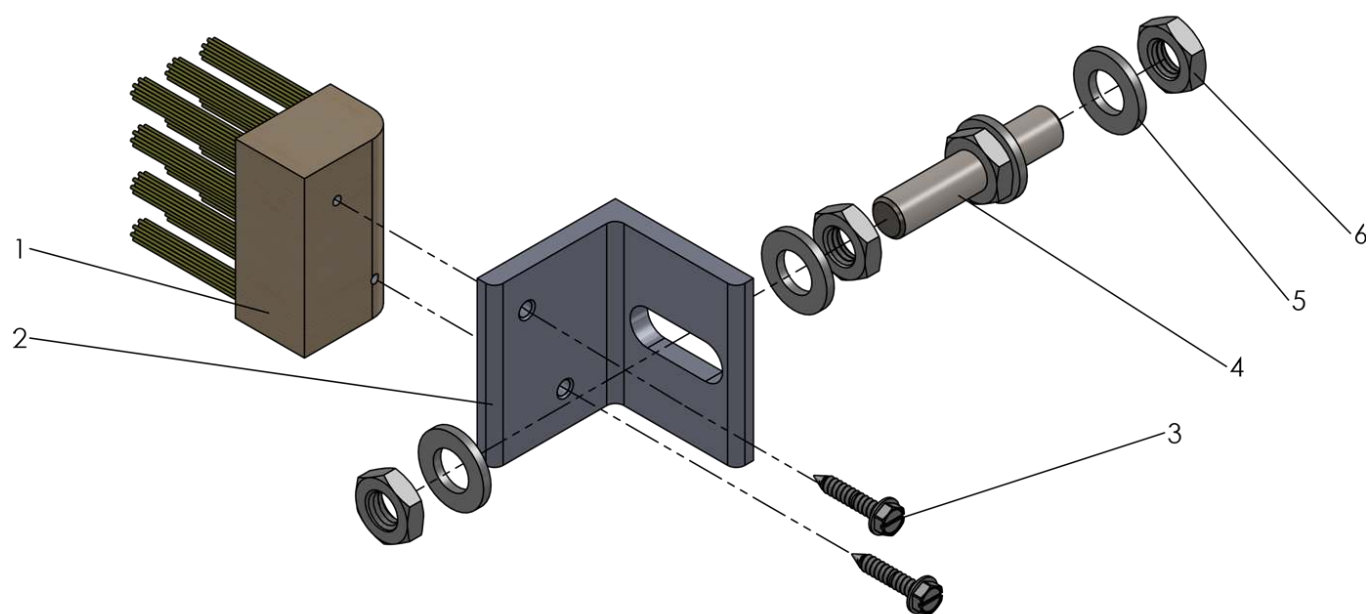
9500-053
NOTE: LARGE BRUSH ASSY
-SEE PAGE [35](#)

9500-052
NOTE: SMALL BRUSH ASSY
-SEE PAGE [33](#)



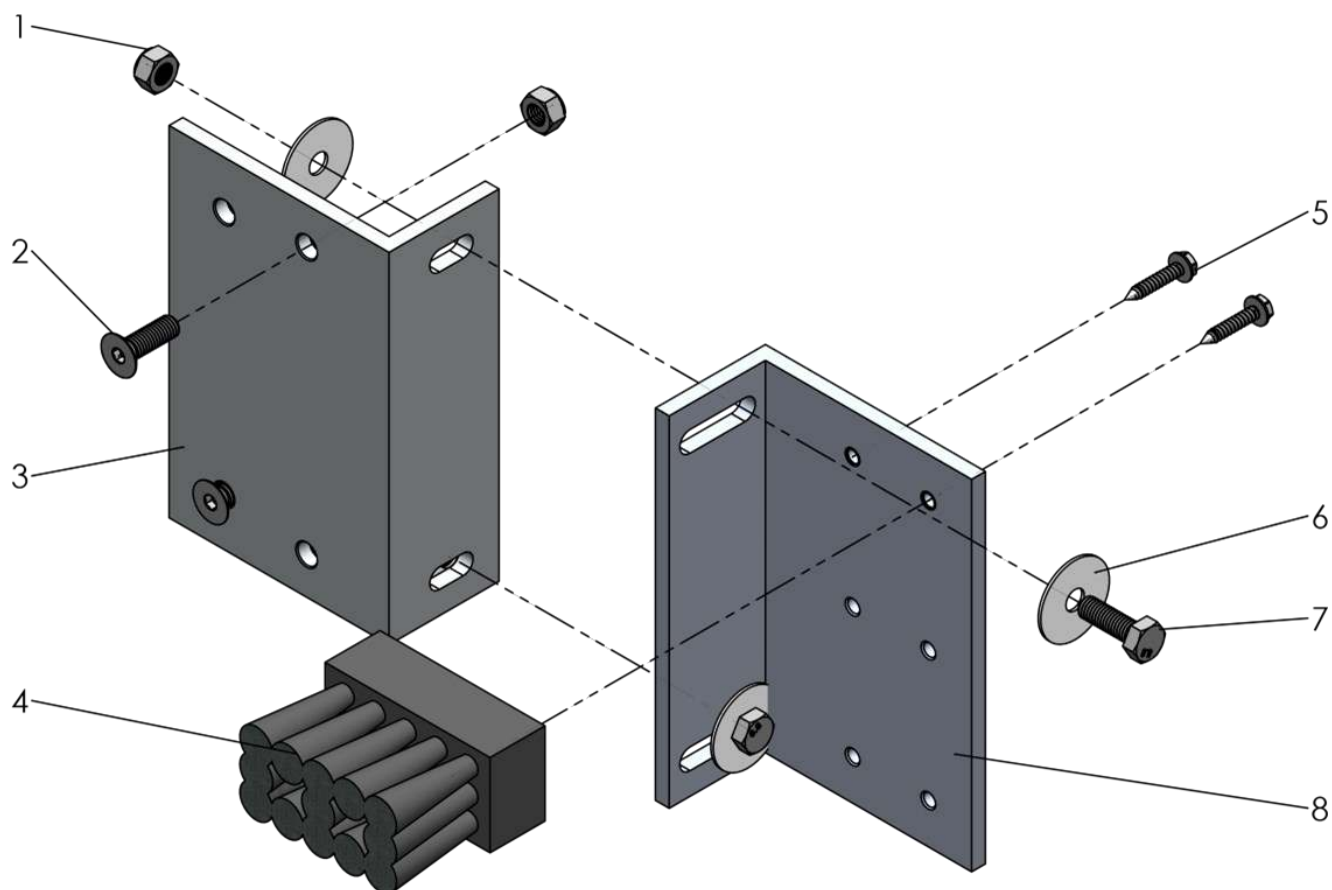
SMALL SPANKER BRUSH ASSEMBLY #9500-052				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	9000-038A	BRUSH - CARD SEPARATOR, SMALL		1
2	7000-238	BRACKET - SMALL BRUSH		1
3	1000-539	SCREW - #10 X 1.0in HHS, FLANGED	MCS# 90054A247	2
4	1000-458	STUD - M12 X 1.75P X 80mm, FULLY THREADED	MCS# 90435A163	1
5	2000-019	WASHER - M12	MCS# 91166A290	4
6	1500-059	NUT - M12 X 1.75P JAM	MCS# 90695A115	4

SMALL SPANKER BRUSH ASSEMBLY



SPANKER BRUSH ASSEMBLY #9500-053				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	M8 NYL	NUT - M8 X 1.25P NYLOC	MCS# 90576A117	4
2	M8-25-FH	SCREW - M8 X 1.25P X 25mm FHCS	MCS# 91294A286	2
3	7000-237	BRACKET - LARGE BRUSH MOUNT		1
4	10430	BRUSH - CARD SEPARATOR, LARGE		1
5	1000-539	SCREW - #10 X 1.0in HHS, FLANGED	MCS# 90054A247	2
6	2000-051	WASHER - M8 FENDER	MCS# 91100A160	6
7	M8-25-HH	SCREW - M8 X 1.25P X 25mm HHC	MCS# 91280A534	2
8	7000-211	BRACKET - CARD BRUSH MOUNT		1

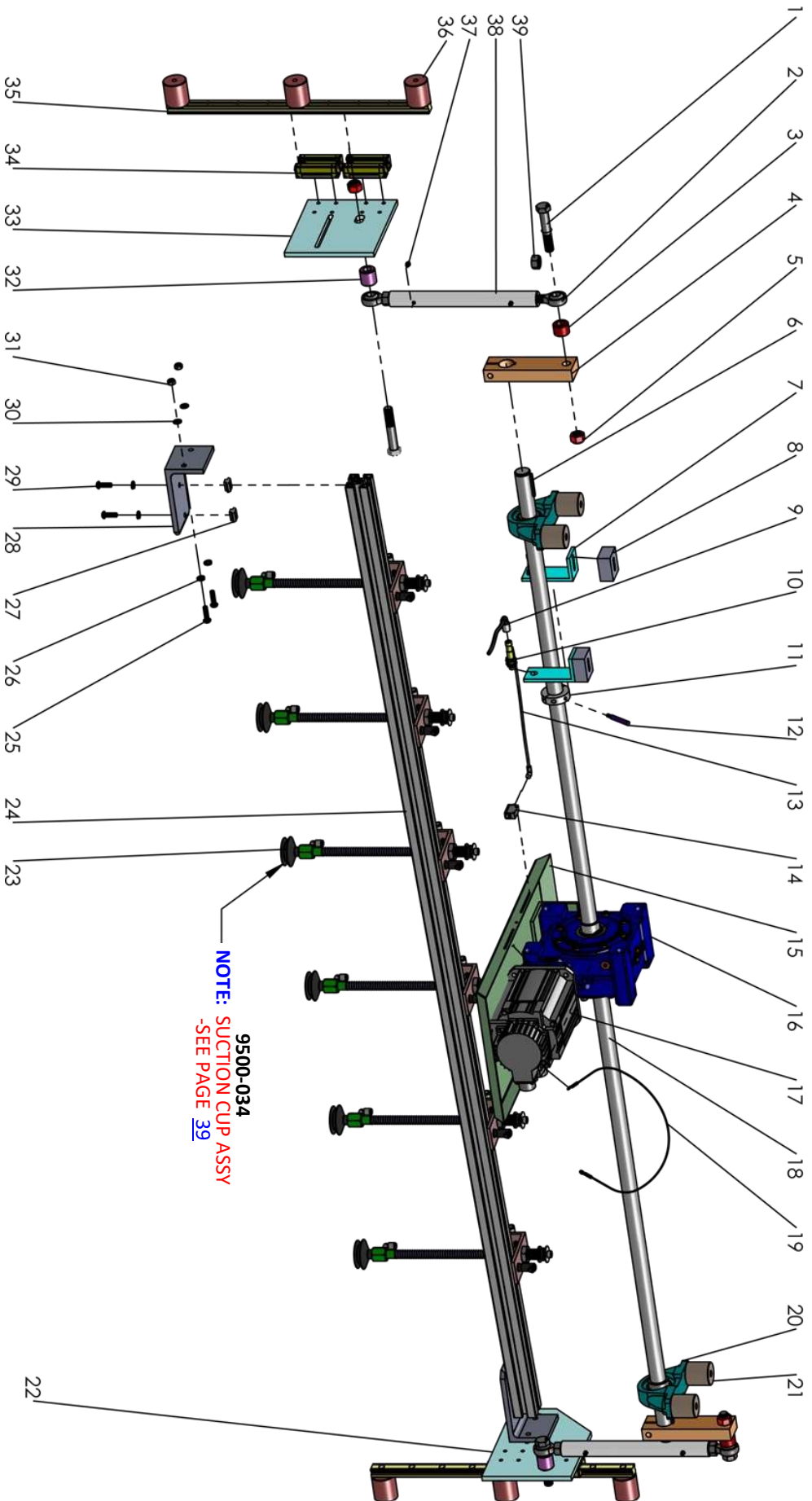
SPANKER BRUSH ASSEMBLY



LOAD FRAME DETAIL				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	M16-90-HH	SCREW - M16 X 2.0P X 90mm HHC	MCS# 91280A852	4
2	4500-161	JOINT - 16mm X 2.0P MALE, ROD END	MCS# 59935K87; SC19	4
3	2000-106	SPACER - UPPER BALL JOINT	SC-10	2
4	7000-216	BRACKET - SWING ARM	SC-07	2
5	M16 NYL	NUT - M16 X 2.0P NYLOC	MCS# 90576A122	4
6	2500-071	KEY - 8mm X 7mm X 50mm		2
7	7000-369	BRACKET - PROXIMITY MOUNT	SF7-B4	2
8	2000-092	SPACER - BRACKET, PROXIMITY	SF7A	2
9	8600-000	CABLE - 4 PIN PROXIMITY SENSOR	BBTI# PHOENIX - 1406248	2
10	8501-047	SENSOR - INDUCTIVE PROXIMITY	BBTI# SENSOPART - 996-51449-IS 512-48-S	2
11	4500-215	CLAMP - LOCK COLLAR	SW4-A	1
12	2500-060	ROD - POSITION		1
13	8501-073	CABLE - PHOTO EYE SENSOR	BBTI# PHOENIX - 1406242	1
14	8501-048	SENSOR - PHOTO EYE	BBTI# SENSOPART - 606-11008-FR 25-R-PS-4M4	1
15	7000-293	PAN - DRIP, GEARBOX		1
16	7500-023	GEARBOX - ALPHA	BBTI# ALPHA - VDH063-MF1-016-041-BD2	1
17	7500-040	MOTOR - SERVO, SIGMA V	BBTI# YASKAWA - SGMGV-13D3A6C	1
18	3000-107	SHAFT - LOAD	SC-03	2
19	8600-071	LANYARD - 0.0469in EYE TO EYE X 24.0in LONG	MCS# 90312A334	1
20	4500-160	BEARING - 30mm ID, PILLOW BLOCK	PTI# P2BSC30M	2
21	2000-093	STANDOFF - 45mm OD X 46.2mm LONG	SC06	4
22	7000-312	PLATE - BEARING, SPRAG SIDE	SC14	1
23	9500-034	ASSEMBLY - LOAD SUCTION CUP		6
24	3000-071	BAR - LOAD	80/20# 45-4545 X 2183mm; SF10-A	1
25	M8-30-BH	SCREW - M8 X 1.25P X 30mm BHCS	MCS# 91239A428	4
26	M8-SPL	WASHER - M8 SPLIT LOCK	MCS# 91202A230	8
27	1500-042	NUT - M8 X 1.25P SLIDE IN T-NUT	80/20# 45-13049	4
28	7000-594	BRACKET - LOAD BAR MOUNT		2
29	M8-25-HH	SCREW - M8 X 1.25P X 25mm BHCS	MCS# 91239A427	4
30	2000-062	WASHER - M8	MCS# 91166A270	4
31	M8 NYL	NUT - M8 X 1.25P NYLOC	MCS# 90576A117	4
32	2000-094	SPACER - LOWER BALL JOINT	SC12	2
33	7000-311	PLATE - BEARING, OPERATOR SIDE	SC13	1
34	4500-047	BEARING - SSR25 LINEAR	THK# SSR25XW1SS(GK)	4
35	3000-067	RAIL - SR25 X 520mm	THK# SR25 X 520 RAIL	2
36	2000-095	STAND OFF - THK RAIL	SC01	6
37	3500-038	STRAIGHT - M6 X 1.0P, GREASE FITTING	MCS# 1105K71	4
38	2500-070	ROD - CONNECTING	SC08	2
39	M16-HEX	NUT - M16 X 2.0P STD	MCS# 90591A220	4

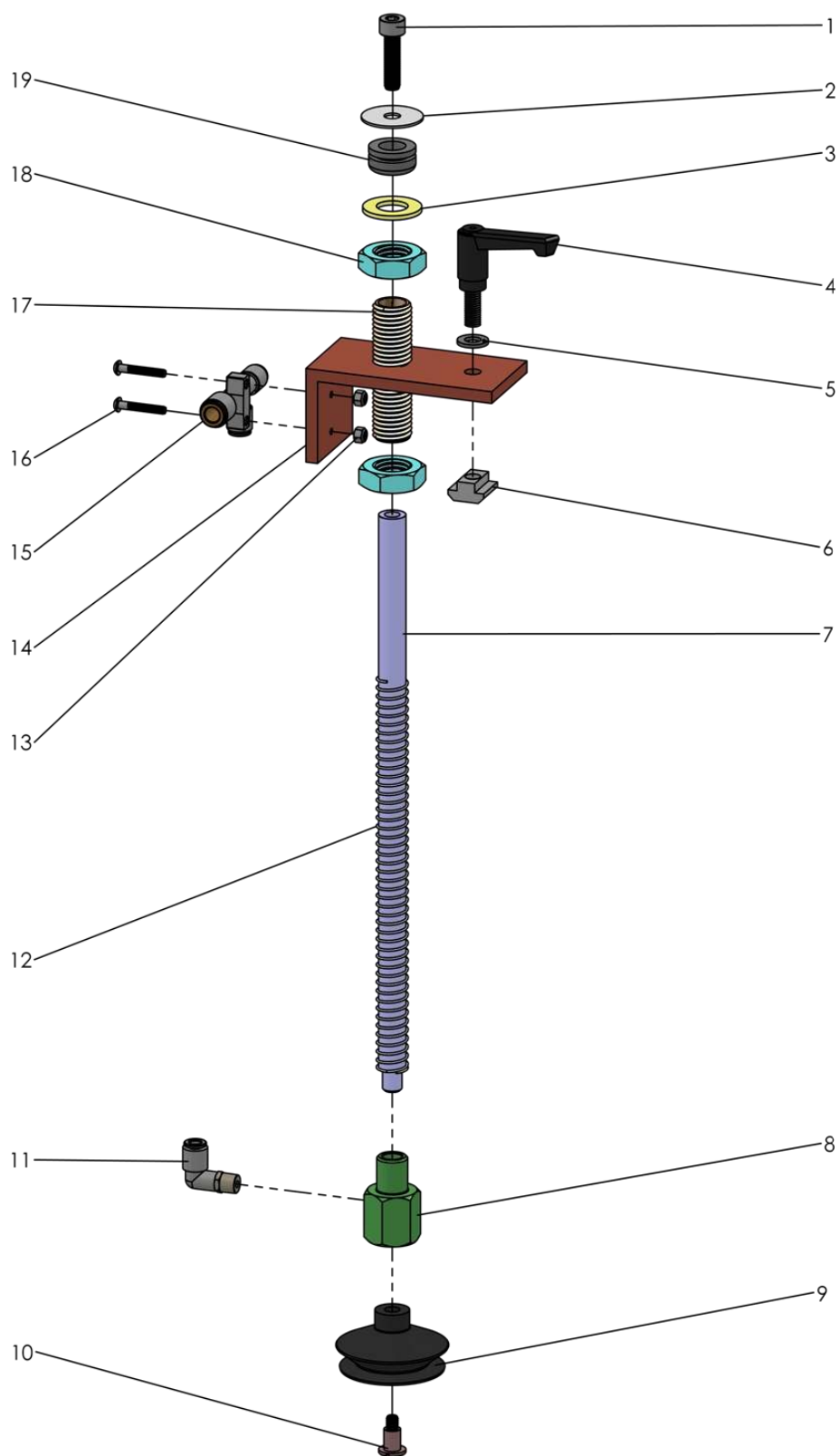
LOAD FRAME DETAIL

NOTE: AIR SYSTEM SCHEMATICS
-SEE PAGE [164](#)



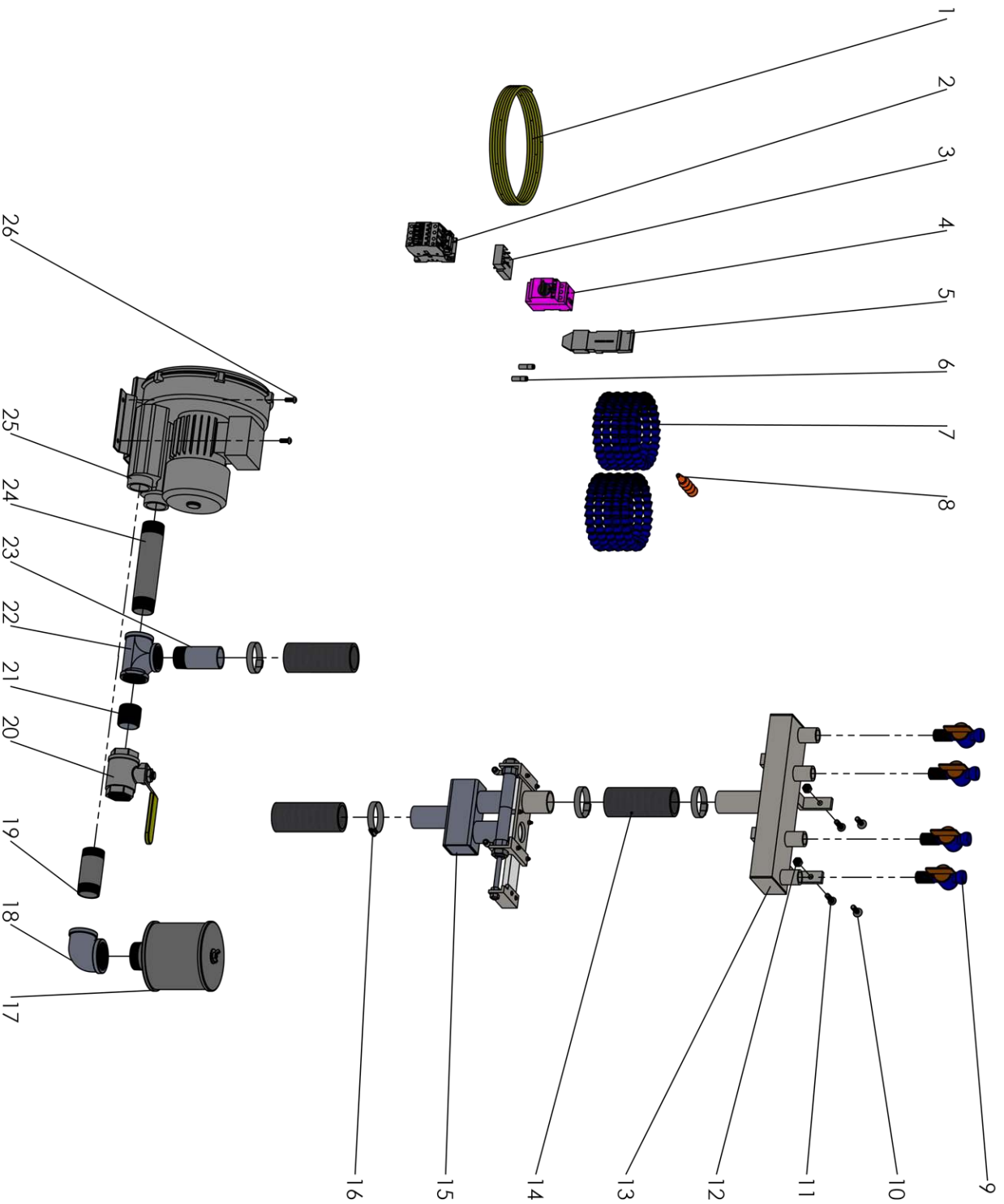
LOAD SUCTION CUP ASSEMBLY #9500-034				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	M8-30-SH	SCREW - M8 X 1.25P X 30mm SHCS	MCS# 91290A434	1
2	2000-051	WASHER - M8 FENDER	MCS# 91100A160	1
3	2000-031	WASHER - FIBERGLASS	MCS# 93493A109	1
4	4000-050	HANDLE - M8 X 1.25P X 20mm, ADJUSTABLE	MCS# 60235K76	1
5	2000-062	WASHER - M8	MCS# 91166A270	1
6	1500-042	NUT - M8 X 1.25P SLIDE IN T-NUT	80/20# 45-13049	1
7	3000-064	SHAFT - 14mm OD X 12in LONG		1
8	3500-019	ADAPTER - FEED CYLINDER CUP		1
9	4900-031	CUP - VSA-53	COVAL# VSA-53NBR	1
10	3500-025	SCREW - HS6 FIXING	E.L. SIMETH# HS6	1
11	3500-306	ELBOW - 6mm X 1/8 RPT	SMC# KQ2L06-01AS	1
12	7600-026	SPRING - SUCTION CUP	FVSC# 00231139	1
13	M4 NYL	NUT - M4 X 0.7P NYLOC	MCS# 90576A113	2
14	7000-202	BRACKET - FEED END		1
15	4900-009	GENERATOR - VACUUM	SMC# ZH10DS-06-06-08	1
16	M4-25-BH	SCREW - M4 X 0.75P X 25mm BHCS	MCS# 92095A197	2
17	4500-148	BUSHING - M20 X 2.5P, THREADED BRONZE		1
18	1500-056	NUT - M20 X 2.5P JAM	MCS# 90710A045	2
19	2000-033	WASHER - DAMPENING	MCS# 9311K12	1

LOAD SUCTION CUP ASSEMBLY



THIN BOARD FEEDER ASSEMBLY #9500-065 (OPTIONAL)				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	6500-007PUY	TUBING - 6mm YELLOW POLYURETHANE (sold per meter)	SMC# TU0604Y-100M YELLOW COIL	10
2	8501-123	CONTACTOR - BLOWER MOTOR	BBTI# LOVATO - BF12011D024 (28A)	1
3	8506-004	BASE - POWER BUS	BBTI# LOVATO - SM1X3142R	1
4	8501-135	BREAKER - BLOWER MOTOR	BBTI# LOVATO - 11SM1B28 (2.5-4A)	1
5	8506-005	BASE - ADAPTER FOR CONTACTOR, BREAKER	BBTI# LOVATO - 11SMX9010	1
6	3500-331	REDUCER - 10mm to 6mm, PLUG IN	SMC# KQ2R06-10A	2
7	6500-026	HOSE - 0.75in X 5.0ft, LOC-LINE	MCS# 10095K99	2
8	6200-007	NOZZLE - 0.75in, LOC-LINE	MCS# 10095K23	4
9	7600-051	VALVE - LOC-LINE, 0.75in	MCS# 10095K73	4
10	M10-35-FH	SCREW - M10 X 1.5P X 35mm FHCS	MCS# 91294A334	2
11	M10-35-BH	SCREW - M10 X 1.5P X 35mm BHCS	MCS# 91239A518	2
12	M10-NYL	NUT - M10 X 1.5P NYLOC	MCS# 94645A220	2
13	3500-058	WELDMENT - MANIFOLD		1
14	6500-027	HOSE - 2.0in ID X 2.5in OD X 2.5ft PVC TUBING	MCS# 52375K21	1
15	10340	ASSEMBLY - THIN BOARD WYE WITH SLICER		1
16	7000-268	CLAMP - HOSE	MCS# 5415K22	4
17	10448	FILTER - 2in AIR INTAKE	MCS# 4401K18	1
18	10449	ELBOW - ADAPTOR, 1.5in - 2in NPT	MCS# 44605K428	1
19	10470	PIPE - 1.5 NPT X 4in NIPPLE, STEEL	MCS# 44615K468	1
20	7600-052	VALVE - 1.5 NPT, BALL	MCS# 47865K270	1
21	6500-035	NIPPLE - 1.5 NPT, STEEL	MCS# 44615K418	1
22	6500-036	TEE - 1.50 NPT, STEEL	MCS# 44605K158	1
23	6500-034	PIPE - 1.50 NPT X 4.0in, STEEL, CUT-OFF	MCS# 7753K148	1
24	6500-029	PIPE - 1.50 NPT X 8.0in, STEEL	MCS# 44615K528	1
25	7500-048	BLOWER - FAN	REPUBLIC BLOWER HRC200	1
26	M8-20-BH	SCREW - M8 X 1.25P X 20mm BHCS	MCS# 19239A426	4

THIN BOARD FEEDER ASSEMBLY (OPTIONAL)



SINGLE FACE - LOAD BLOWER ASSEMBLY (OPTIONAL)				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	7500-054	BLOWER - FAN HRC600	REPUBLIC# HRB600	1
2	6500-069	WELDMENT - BLOWER EXHAUST, SF		1
3	7000-493	CLAMP - 2.50" DIA. TUBE, SF	MCS# 4322K154	1
4	4900-052	SEAL - 2.50" TUBE OD, SF	MCS# 4509K16	1
5	3500-081	MANIFOLD - LOAD, SF		1
6	8506-005	BASE - ADAPTER FOR CONTACTOR, BREAKER	BBTI# LOVATO - 11SMX9010	1
7	8506-004	BASE - POWER BUS	BBTI# LOVATO - SM1X3142R	1
8	8501-123	CONTACTOR - BLOWER MOTOR	BBTI# LOVATO - BF1201D024 3P	1
9	8501-126	BREAKER - CIRCUIT SM1RE1000	BBTI# LOVATO—SM1RE 1000	1
10	3500-087	PLUG - MALE COUPLING, SF	MCS# 5535K68	1
11	7000-494	FRAME - LOAD, SF		1

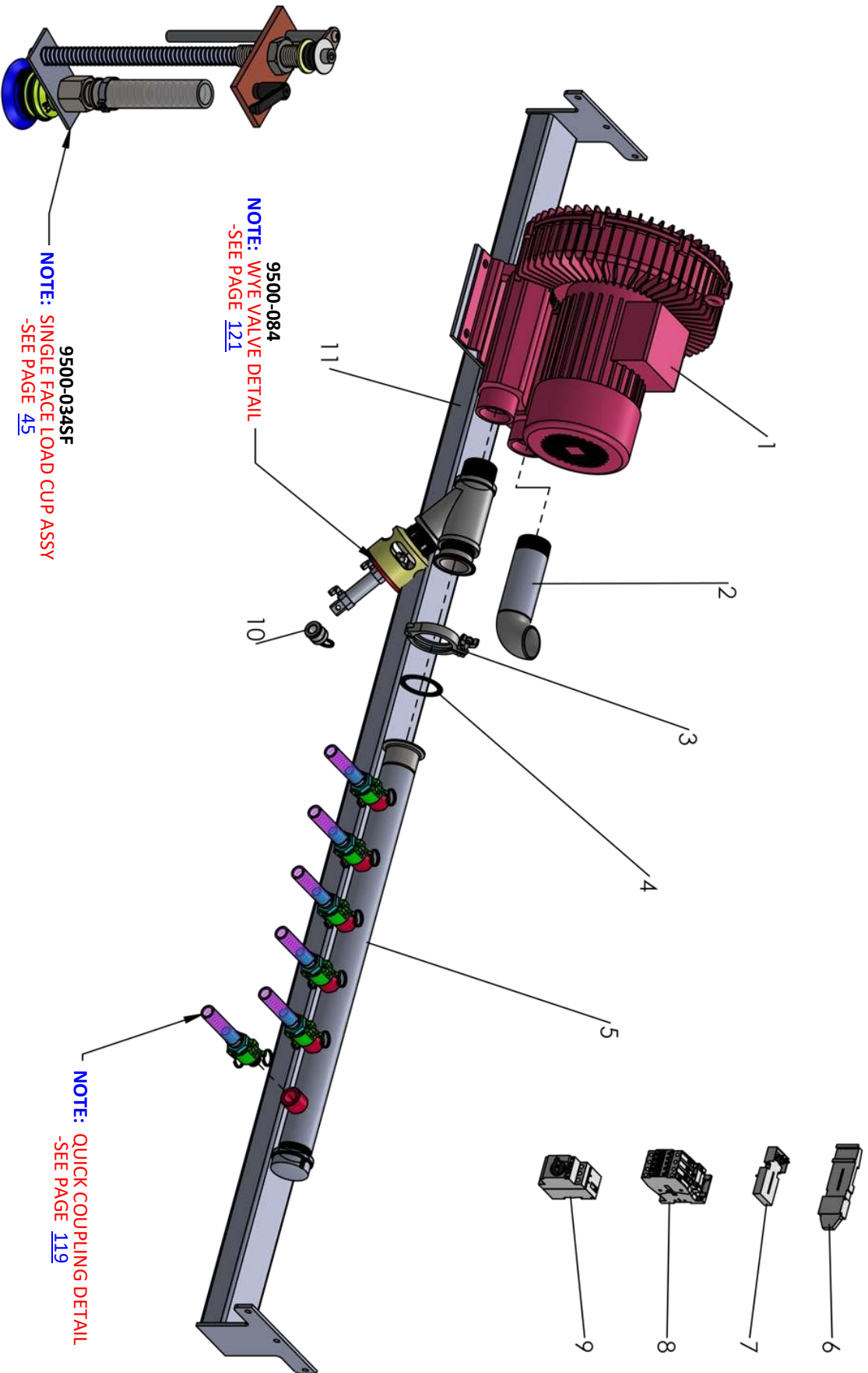
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NOTE: SINGLE FACE OPTION KIT INCLUDES:

SINGLE FACE - LOAD BLOWER ASSEMBLY (This page)

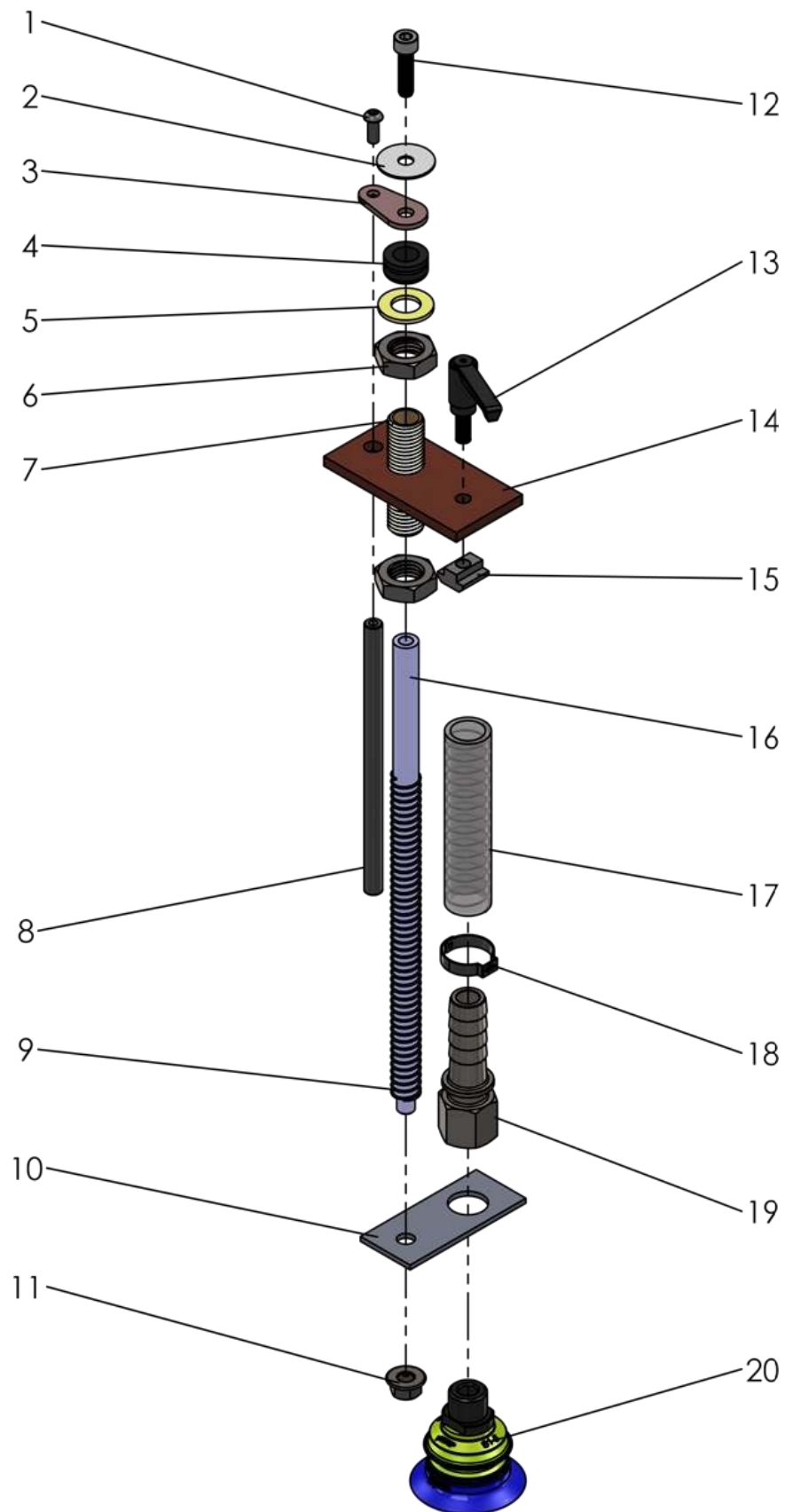
SINGLE FACE - UNLOAD BLOWER ASSEMBLY (See page [115](#))

SINGLE FACE - LOAD BLOWER ASSEMBLY (OPTIONAL)



SINGLE FACE - LOAD SUCTION CUP ASSEMBLY #9500-034SF (OPTIONAL)				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	M6-16-BH	SCREW - M6 X 1.0P X 16mm BHCS	MCS# 91239A321	1
2	2000-062	WASHER - M8 FENDER	MCS# 91100A160	1
3	2000-124	WASHER - ROD GUIDE, SF		1
4	2000-033	WASHER - DAMPENING	MCS# 9311K12	1
5	2000-031	WASHER - FIBERGLASS	MCS# 93493A109	1
6	1500-056	NUT - M20 X 2.5P JAM	MCS# 90710A045	2
7	4500-148	BUSHING - M20 X 2.5P, THREADED BRONZE		1
8	2500-093	ROD - LOAD CUP GUIDE, SF		1
9	7600-026	SPRING - SUCTION CUP	FVSC# 00231139	1
10	7000-513	PLATE - CYLINDER MOUNT, SF		1
11	1500-084	NUT - M10 X 1.5P FLANGE	MCS# 92461A500	1
12	M8-30-SH	SCREW - M8 X 1.25P X 30mm SHCS	MCS# 91290A434	1
13	4000-050	HANDLE - M8 X 1.25P X 20mm, ADJUSTABLE	MCS# 60235K76	1
14	7000-202	PLATE - FEED END BRACKET		1
15	1500-042	NUT - M8 X 1.25P SLIDE IN T-NUT	80/20# 45-13049	1
16	3000-064	SHAFT - 14mm OD X 12in LONG		1
17	6500-065	TUBING - 3/4 CLEAR SINGLE FACE	MCS# 5136K17	1
18	7000-487	CLAMP - 0.89-1.06 PINCH	MCS# 54285K38	1
19	3500-084	FITTING - LOAD CUP FEMALE, SF	MCS# 5350K78	1
20	4900-048	CUP - LOAD SINGLE FACE	PIAB# G.BGI63S50.B1.S1.NT12M.00	1

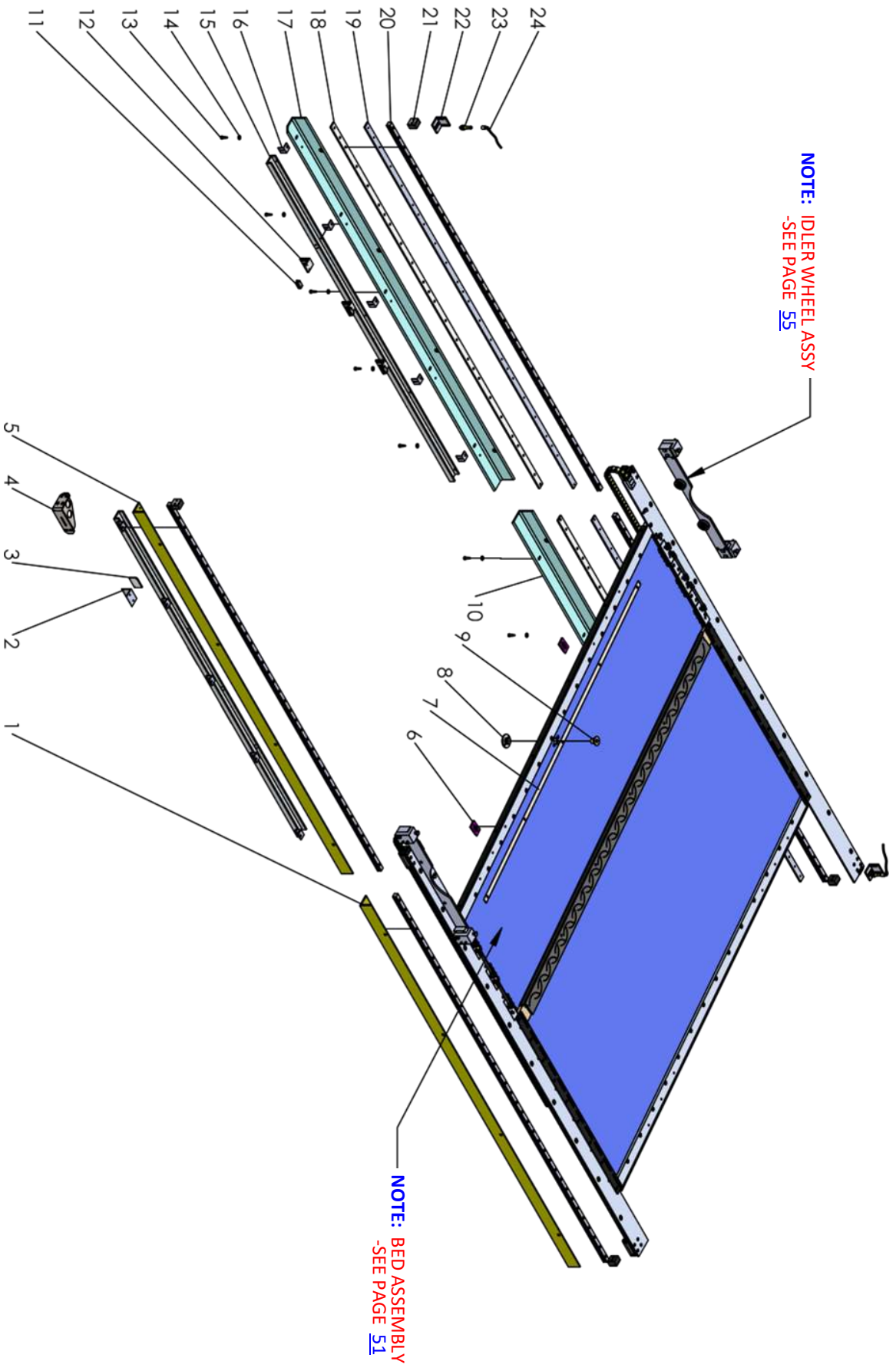
SINGLE FACE - LOAD SUCTION CUP ASSEMBLY (OPTIONAL)



Bed / Roller

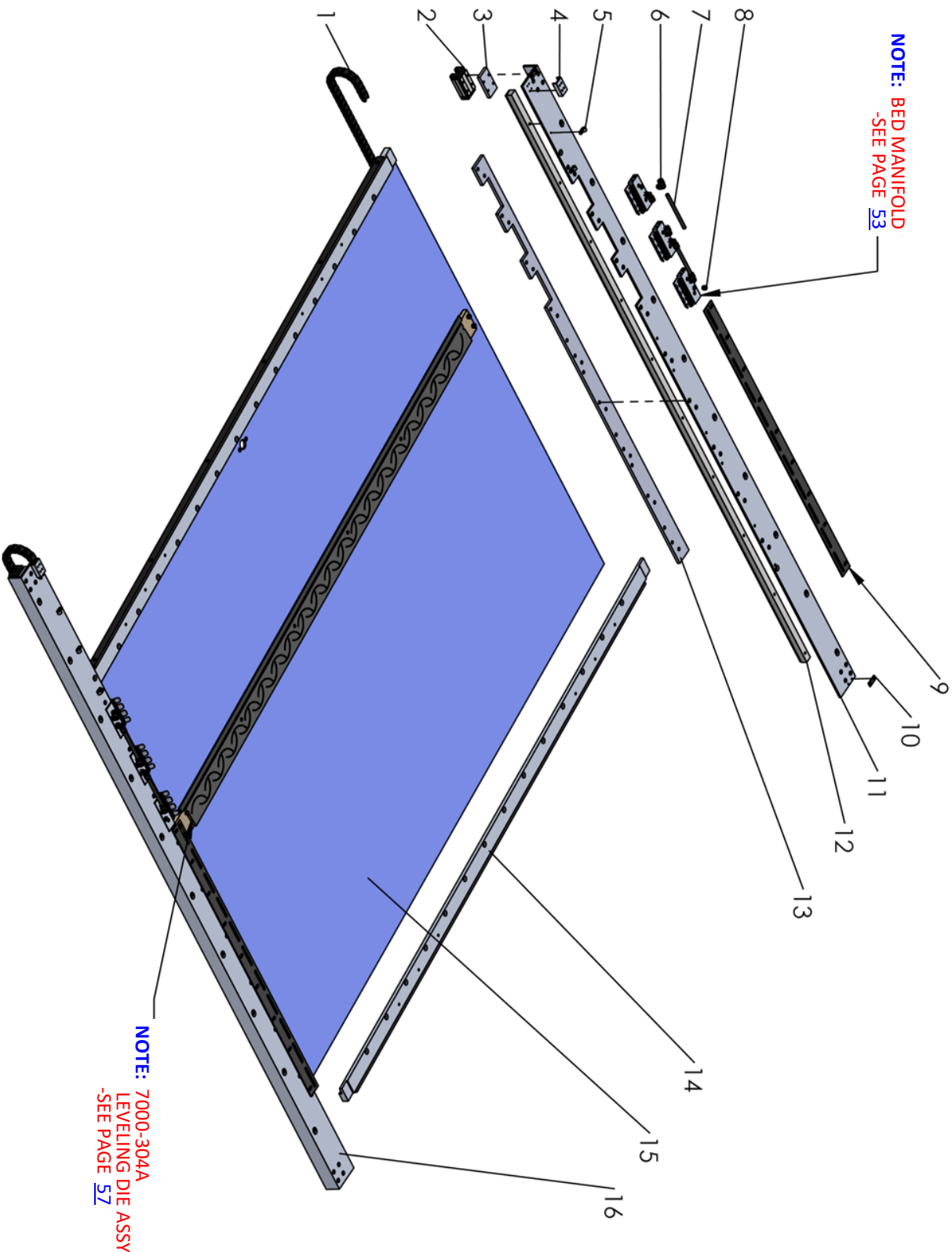
BED RAIL ASSEMBLY				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	7000-952	BRACKET - BED RAIL, LOAD OPERATOR		1
2	7000-960	BRACKET - REFLECTOR MOUNT		3
3	8501-051	REFLECTOR - OMRON	BC# OMRON - E39-R1	5
4	7000-811	BRACKET - UNIVERSAL TOOL HOLDER / BUMPER		2
5	7000-951	BRACKET - BED RAIL, UNLOAD OPERATOR		1
6	7000-230	TAB - KEEPER		2
7	7000-957	PLATE - BED SAVER		1
8	1500-028N	NUT - DIE LATCH		1
9	1000-425N	BOLT - DIE LATCH - 14mm		1
10	7000-954	BRACKET - BED RAIL, LOAD SPRAG		1
11	8501-048	SENSOR - PHOTO EYE	BBTI# SENSOPART - 606-11008-FR 25-R-PS-4M4	3
12	7000-313	BRACKET - PILE HEIGHT, STRAIGHT HOLES	MP4-A	3
13	1000-628	SCREW - M6 X 1.0P X 8mm X 15mm SHOULDER	MCS# 92981A752	10
14	2000-162	WASHER - M8, NYLON	MCS# 95610A380	10
15	7000-962	CHANNEL - IGUS CARRIER		2
16	7000-961	BRACKET - IGUS CARRIER		10
17	7000-953	BRACKET - BED RAIL, UNLOAD SPRAG		1
18	7000-955	BAR - FLOAT, NARROWED		2
19	7000-950	BAR - FLOAT, BED		2
20	3000-155	RAIL - SHS25 X 2275mm	THK# SHS25 X 2275 RAIL	4
21	4200-040	BUMPER - BED RUBBER	MCS# 9306K831	4
22	7000-579	BRACKET - OVERTRAVEL PROX		2
23	8501-047	SENSOR - INDUCTIVE PROXIMITY	BBTI# SENSOPART - 996-51449-IS 512-48-S	2
24	8600-000	CABLE - 4 PIN PROXIMITY SENSOR	BBTI# PHOENIX - 1406248	2

BED RAIL ASSEMBLY



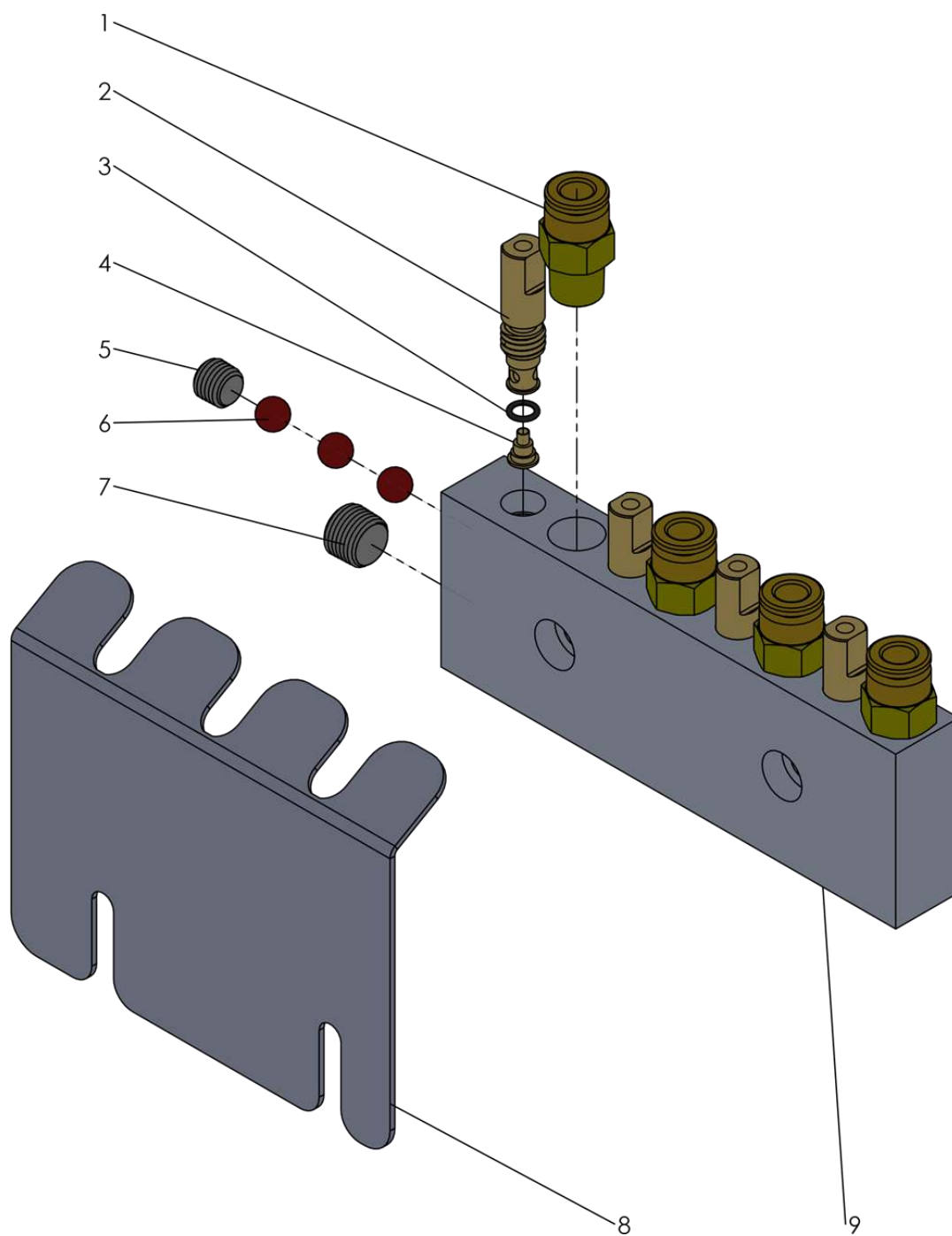
BED ASSEMBLY				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	8600-024	CABLE - CARRIER, IGUS 6 FOOT	IGUS# 06-16-028-0	2
2	4500-233	BEARING - LINEAR SHS25R1SS	THK# SHS25R1SS	4
3	7000-956	SPACER-THK BEARING		4
4	7000-322	PLATE - IGUS CARRIER CLAMP		2
5	3500-655	CLAMP-10 MM NYLON PLASTIC, LOOP	MCS# 8876T22	5
6	10255	ELBOW - 90 DEGREE FOR 10MM TUBE	MCS# 7699N123	10
7	6500-009PUB	TUBING - 10MM PU BLACK (SOLD PER METER)	SMC# TU1065B-100 BLACK (Qty (4) - 6" pieces)	1
8	3500-071	PLUG - 1/4NPT HEX SOCKET	MCS# 50785K113	2
9	7000-965	PLATE - LEVELING DIE KEEPER UNIVERSAL		2
10	7000-748	PLATE - BED END FLAG		2
11	10343	ANGLE - BED RAIL, C190 SPRAG		1
12	4500-214	RACK - GEAR	MG# M2.5 X 2316mm GEAR RACK	2
13	7000-963	SPACER - BED PACKER		2
14	7000-484A	PLATE - BED END		2
15	7000-500	MATERIAL - BED	...INCLUDES 7000-957 - BED SAVER	1
16	10344	ANGLE - BED RAIL, C190 OPERATOR		1

BED ASSEMBLY



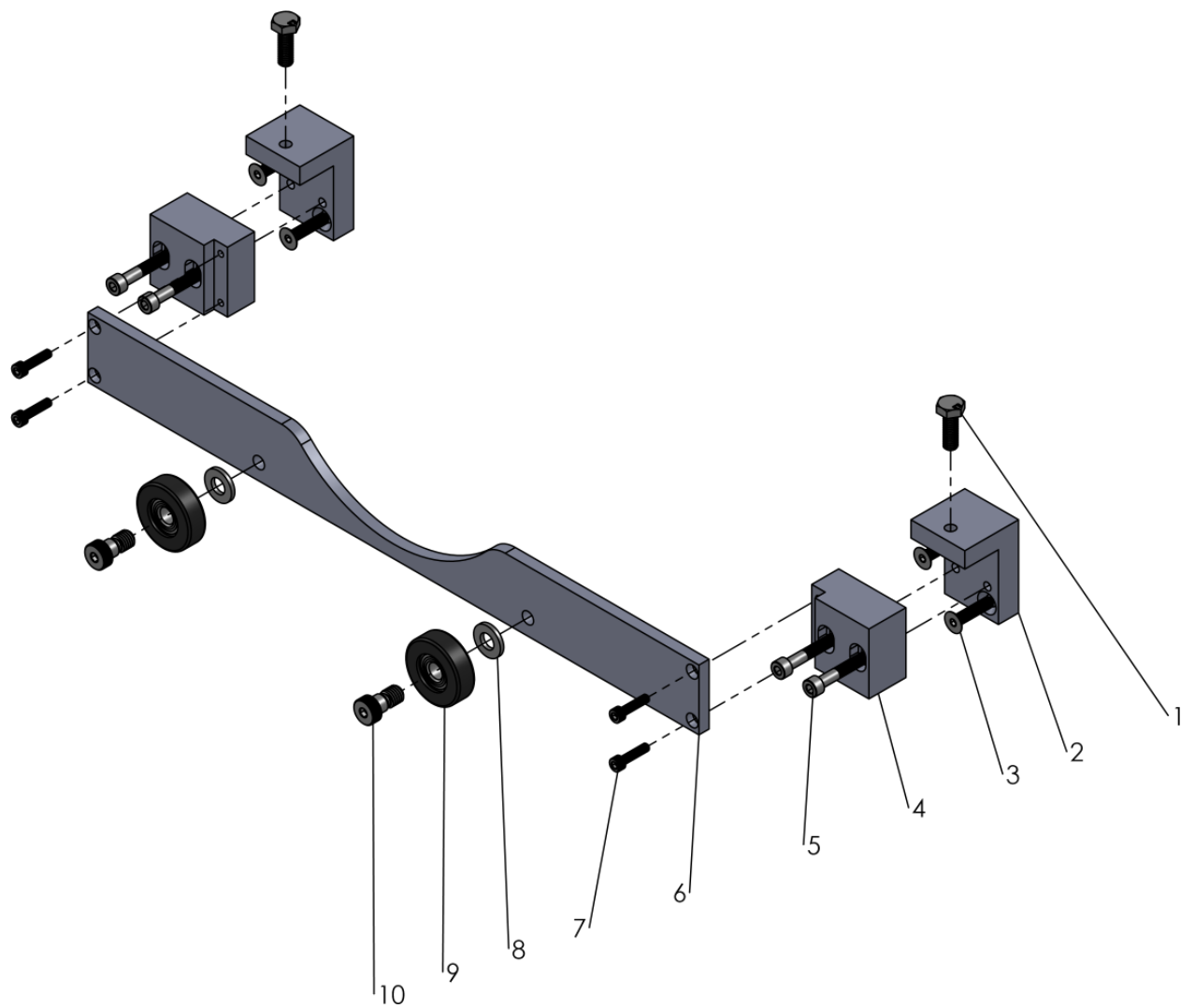
BED MANIFOLD ASSEMBLY #9500-106				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	3500-300	STRAIGHT - 6mm X 1/8 RPT, SELF SEAL	SMC# KCH06-01S	4
2	4900-040	NOZZLE - EXHAUST, ER10		4
3	4900-042	SEAL - O-RING, ER10-18F		4
4	4900-041	NOZZLE - GENERATOR, ER10-N1-039		4
5	3500-657	PLUG - 1/16 NPT HEX SOCKET	MCS# 50785K267	1
6	10260	BALL - BUNA-N RUBBER 1/4"	MCS # 1854T44	3
7	3500-658	PLUG - 1/8 NPT HEX SOCKET	MCS# 50785K112	1
8	10345	DEFLECTOR - C190 BED VACUUM		1
9	3000-163	MANIFOLD - VACUUM BLOCK		1

BED MANIFOLD ASSEMBLY



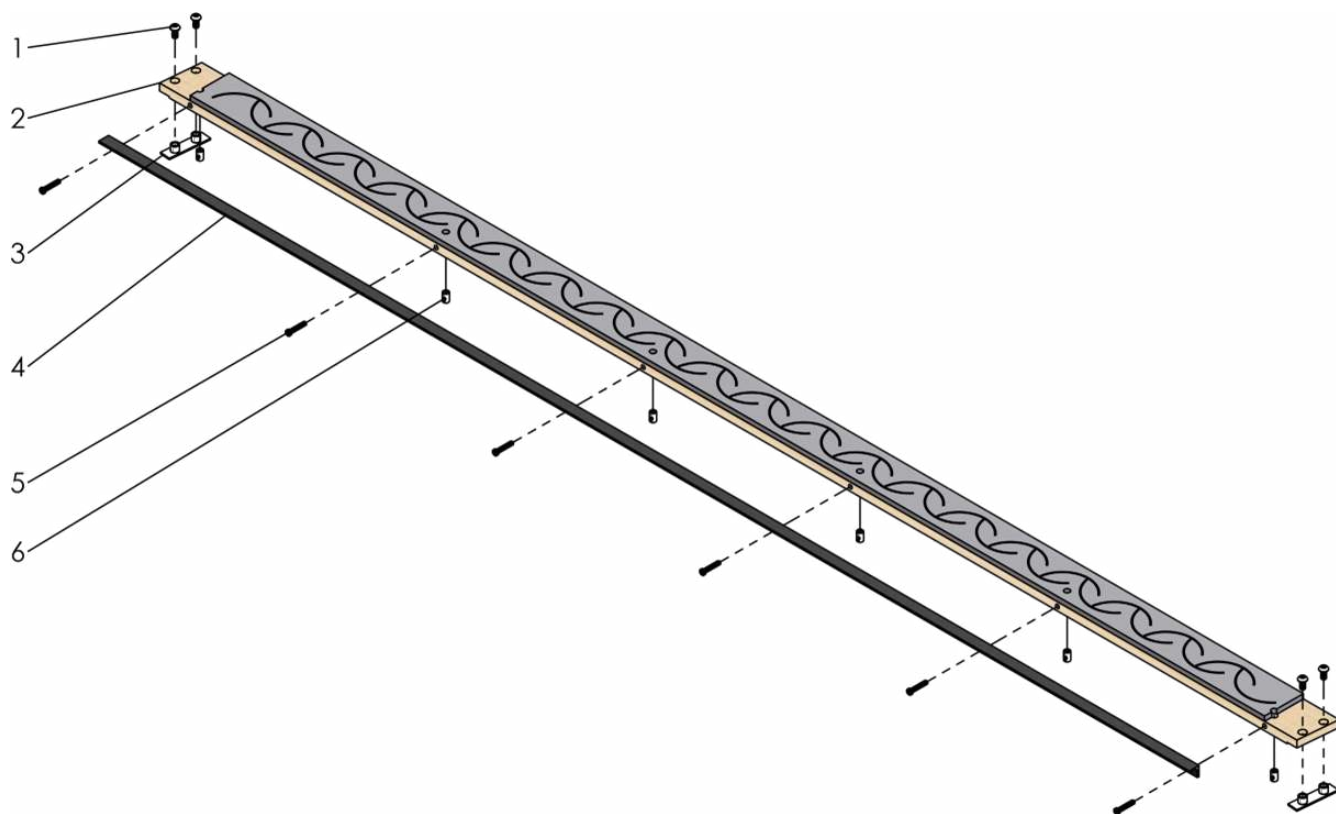
IDLER WHEEL ASSEMBLY				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	M10-30-HH	SCREW - M10 X 1.5P X 30MM HHC	MCS# 91280A634	2
2	7000-967	BLOCK - IDLER WHEEL TENSION		2
3	M8-35-FH	SCREW - M8 x 1.25P X 35MM FHCS	MCS# 91294A288	4
4	7000-968	MOUNT - IDLER WHEEL BAR		2
5	M8-45-SH	SCREW - M8 X 1.25P X 45MM SHCS	MCS# 91290A446	4
6	7000-966	PLATE - IDLER WHEEL		1
7	M6-25-SH	SCREW - M6 X 1.0P X 25MM SHCS	MCS# 91290A330	4
8	2000-163	SPACER - 1" OD X 1/2" ID X 1/8" THK	MCS# 92510A595	2
9	4000-065	ROLLER - BEARING WHEEL	SUNRAY# N1-C2X0JB 1B POLY-COVERED	2
10	1000-629	SCREW - 1/2"-13 X 1/2" X 3/8" SHOULDER	MCS# 90807A142	2

IDLER WHEEL ASSEMBLY



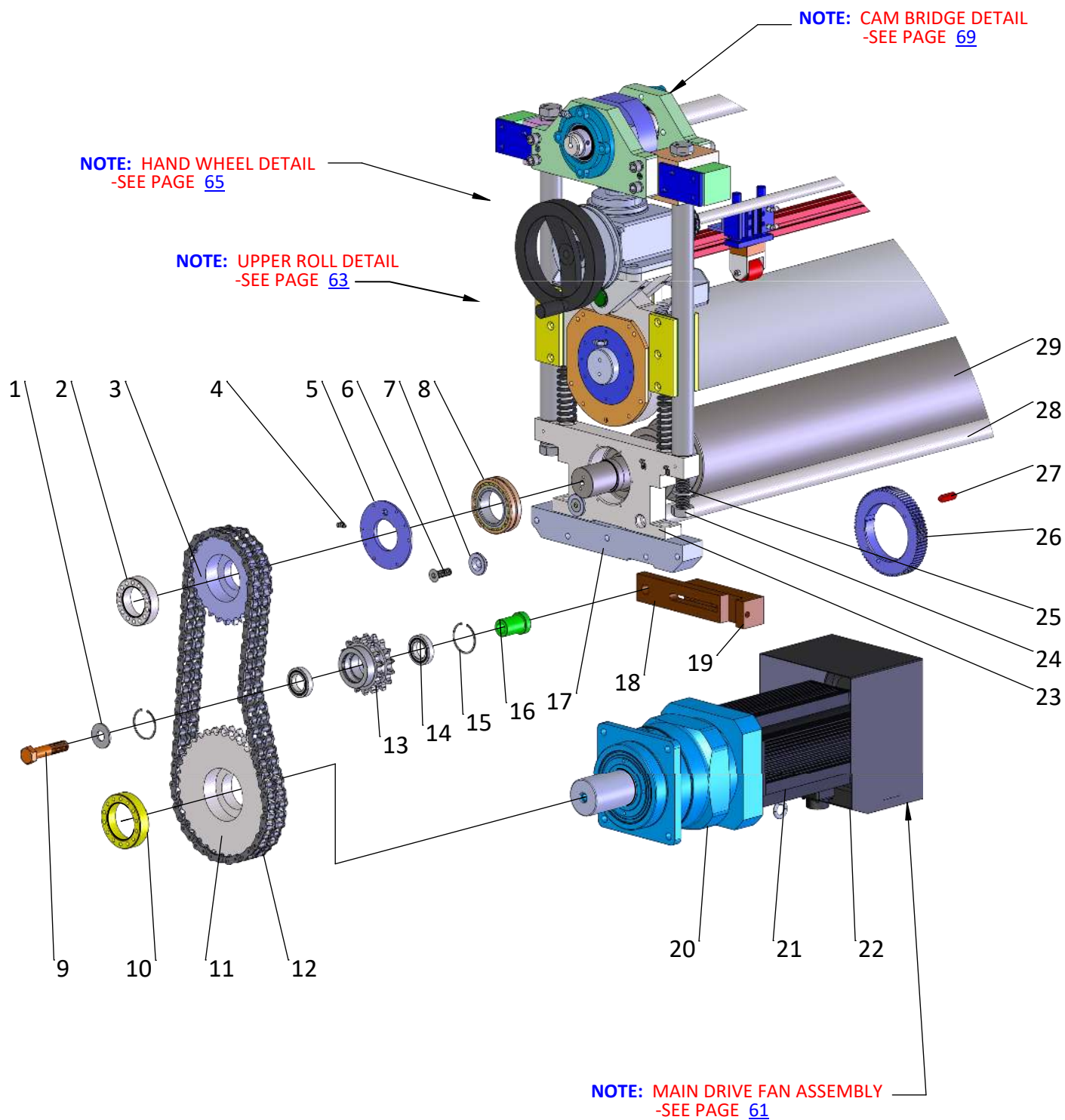
LEVELING DIE ASSEMBLY #7000-304A				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	M8-16-BH	SCREW - M8 X 1.25P X 16mm BHCS	MCS# 91239A418	4
2	7000-304	LEVELING - HALF RADIUS DIE, 190		1
3	7000-212	INSERT - LEVELING DIE ANCHOR		2
4	10081	BRACKET - LEVELING DIE L-BAR		1
5	1000-586	SCREW - 1/4"-20 X 1-1/4" LOW PROFILE SHCS	MCS# 92220A205	6
6	1500-088	NUT—DOWEL, 1/4"- 20 THREAD	MCS# 90835A210	6

LEVELING DIE ASSEMBLY



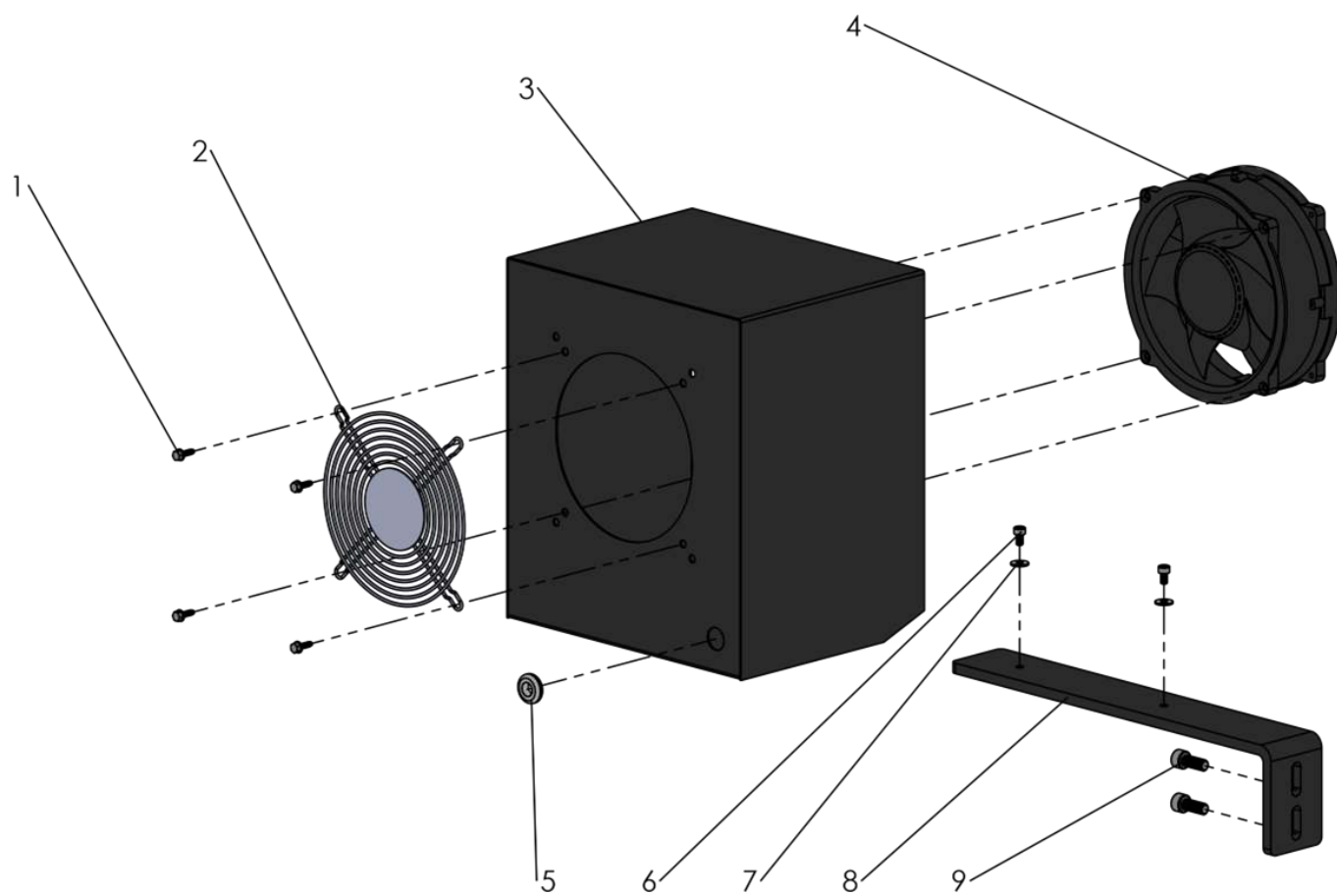
LOWER ROLL DETAIL - OPERATOR SIDE				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	2000-038	WASHER - M24	MCS# 91166A330	1
2	4500-185	BUSHING - 70mm ID X 110mm OD, RINGFEDER	RF# RFN7012 70X110	1
3	4500-196	SPROCKET - LOWER ROLLER	EGI# MARTIN - D16B25	1
4	3500-091	ELBOW - 6mm X 1/8 BSPP, GREASE FITTING	MSC# 08037285	5
5	4500-210	RETAINER - LOWER ROLLER BEARING	RP-07	1
6	M16-50-FH	SCREW - M16 X 2.0P X 50mm FHCS	MCS# 91294A452	4
7	10262	BUSHING - BOLT WASHER		4
8	4500-131	BEARING - ROLLER	SKF# 22215E	4
9	M24-110-HH	SCREW - M24 X 3.0P X 110mm HHC	MCS# 91280A015	1
10	4500-181	BUSHING - 85mm ID X 125mm OD, RINGFEDER	RF# RFN7012 85X125	1
11	4500-195	SPROCKET - MAIN DRIVE	EGI# MARTIN - D16B38	1
12	5000-046	CHAIN - MAIN DRIVE	TSUBAKI 1in DUPLEX CHAIN - 72 PINS	1
13	4500-168	SPROCKET - IDLER	EGI# MARTIN - D16B15	1
14	4500-162	BEARING - IDLER	SKF# 6008 2RSJEM	2
15	2500-035	RING - 68mm INT, RETAINING	AMM - J68	2
16	4500-169	BUSHING - 25mm ID X 40mm OD X 75mm LONG, SHOULDER	RA6-A	1
17	10431	BLOCK - ROLLER MOUNT - HYBRID		1
18	7000-397	PLATE - IDLER MOUNTING, MAIN DRIVE	RA9-A	1
19	7000-939	BLOCK - IDLER PUSHER, MAIN DRIVE		1
20	7500-039	GEARBOX - ALPHA, MAIN DRIVE	BBTI# ALPHA - SP240-MF1-10-141	1
21	7500-038	MOTOR - SERVO, SIGMA V	BBTI# YASKAWA - SGMGV-1ED3A61	1
22	9500-050	ASSEMBLY - SERVO COOLING FAN		1
23	4500-224	HOUSING - LOWER ROLL BEARING	RP-24	2
24	M30-105-HH	SCREW - M30 X 3.5P X 105mm HHC	FC# 0121976	4
25	M30-SPL	WASHER - M30 SPLIT LOCK	MCS# 91202A263	8
26	4500-152	GEAR - 80T, 2.5P MOD SPUR (SOLD AS MATCH SET)	EGI# 2.5 MODULE 80T 20PA 30.35FW	2
27	2500-074	KEY - 14mm X 9mm X 50mm		2
28	3000-157	BAR - TIE		2
29	4000-147	ROLLER - LOWER		1

LOWER ROLL DETAIL - OPERATOR SIDE



MAIN DRIVE FAN ASSEMBLY #9500-050				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	1000-618	SCREW - M5 X 0.8P X 16mm HHFS, THREAD FORMING	MCS# 94209A327	4
2	8000-016	GUARD - SERVO COOLING FAN	MCS# 19155K27	1
3	8000-015	ENCLOSURE - SERVO COOLING FAN		1
4	7500-049	FAN - SERVO COOLING 24VDC	AELEC # 70000267	1
5	8600-077	GROMMET - 0.50in ID X 0.813in OD X 0.060in THICK	MCS# 9307K26	1
6	M6-10-SH	SCREW - M6 X 1.0P X 10mm SHCS	MCS# 91290A316	2
7	M6-WAS	WASHER - M6	MCS# 91166A250	2
8	7000-260	BRACKET - SERVO COOLING FAN		1
9	M10-25-SH	SCREW - M10 X 1.5P X 25mm SHCS	MCS# 91290A520	2

MAIN DRIVE FAN ASSEMBLY

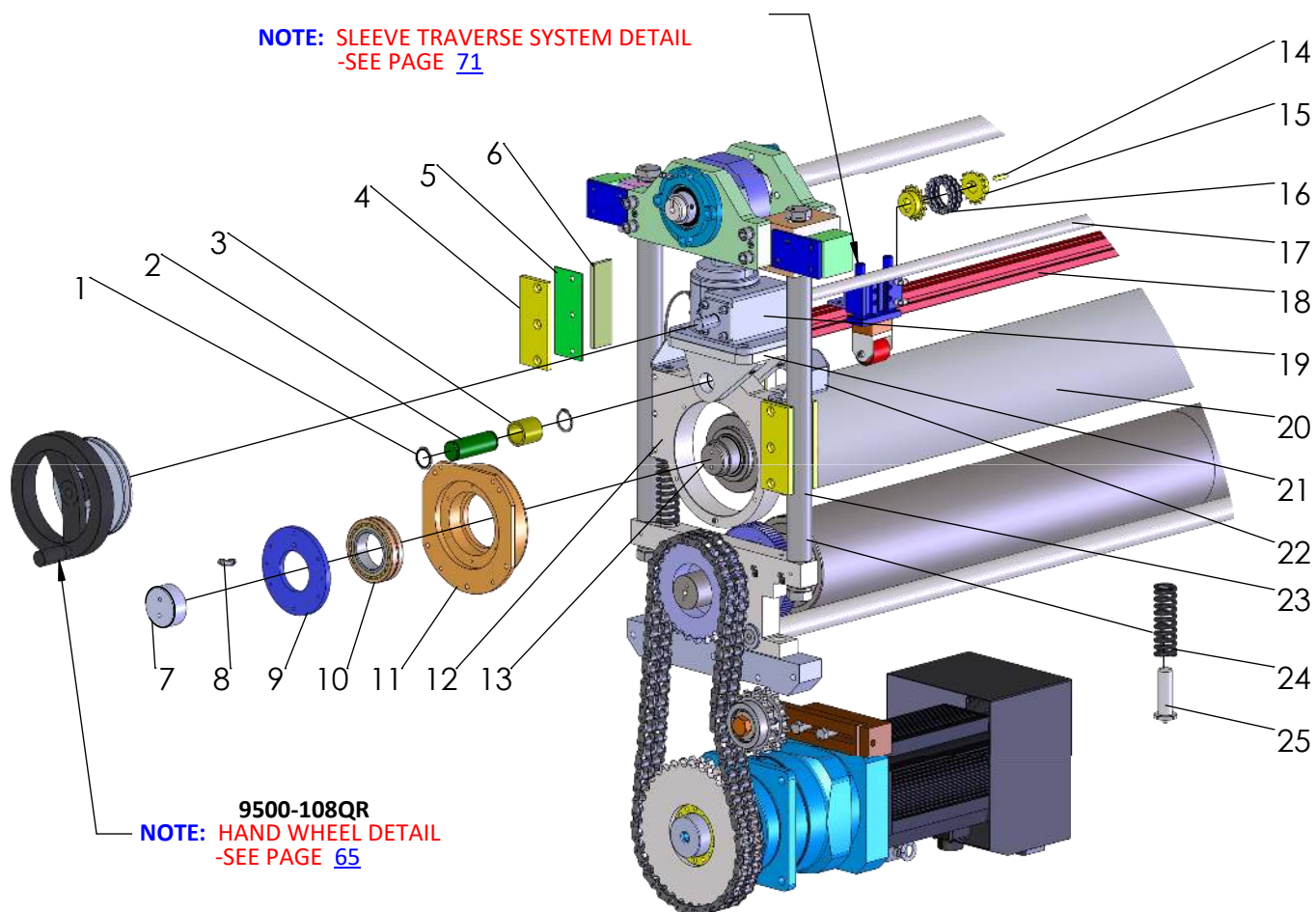


UPPER ROLL DETAIL - OPERATOR SIDE				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	2500-036	RING - 40mm EXT, RETAINING	MCS# 98541A156	2
2	3000-110	SHAFT - NOOK CLEVIS	R9-40	1
3	4500-137	BUSHING - NOOK CLEVIS	AMM - A40-50 X 60mm	1
4	7000-389	PLATE - OUTER	RP-60-2	4
5	7000-240	PLATE - SLIDE BEARING		4
16	2000-040	SPACER - NYOIL		2
7	4500-229	CAP - END, STEEL	RP-04	1
8	3500-060	ELBOW - 6mm X 1/8 BSPP, GREASE FITTING	MSC# 08037285	1
9	4500-204	RETAINER - BEARING	RP-072	1
10	4500-131	BEARING - ROLLER	SKF# 22215E	1
11	4500-227	HOUSING - INSERT	RP-73	1
12	4500-226	HOUSING - OUTER	RP-44	1
13	4000-146	ROLLER - UPPER	RA-39	1
14	2500-077	KEY - 8mm X 7mm X 36mm		2
15	4500-228	SPROCKET - NOOK, COUPLING	EGI# MARTIN - 08B16	2
16	5000-059	CHAIN - NOOK, COUPLING	08B-2 CHAIN	1
17	3000-158	SHAFT - NOOK, CONNECTING		1
18	3000-160	BAR - TRAVERSE	80/20# 45-4545 X 2331mm	1
19	7500-034	JACK - NOOK, METRIC ACTION	NOOK# EM10AB-MSJ-U 24:1 10-TON	1
20	4000-038	SLEEVE - ANVIL	8in X 83in COMMON	1
21	7000-396	BRACKET - NOOK, CLEVIS	RP-39	1
22	10233	BRACKET - TRAVERSE BAR MOUNT, UNIVERSAL	SL4-A	1
23	3000-085	SHAFT - 50mm SLIDE	RP-63	2
24	7600-027	SPRING - HEAVY DUTY	FVSC# FV0024622REV	2
25	7600-028	SHAFT - HD SPRING LOCATOR		2

UPPER ROLL DETAIL - OPERATOR SIDE

NOTE: CAM BRIDGE DETAIL
-SEE PAGE [69](#)

NOTE: SLEEVE TRAVERSE SYSTEM DETAIL
-SEE PAGE [71](#)

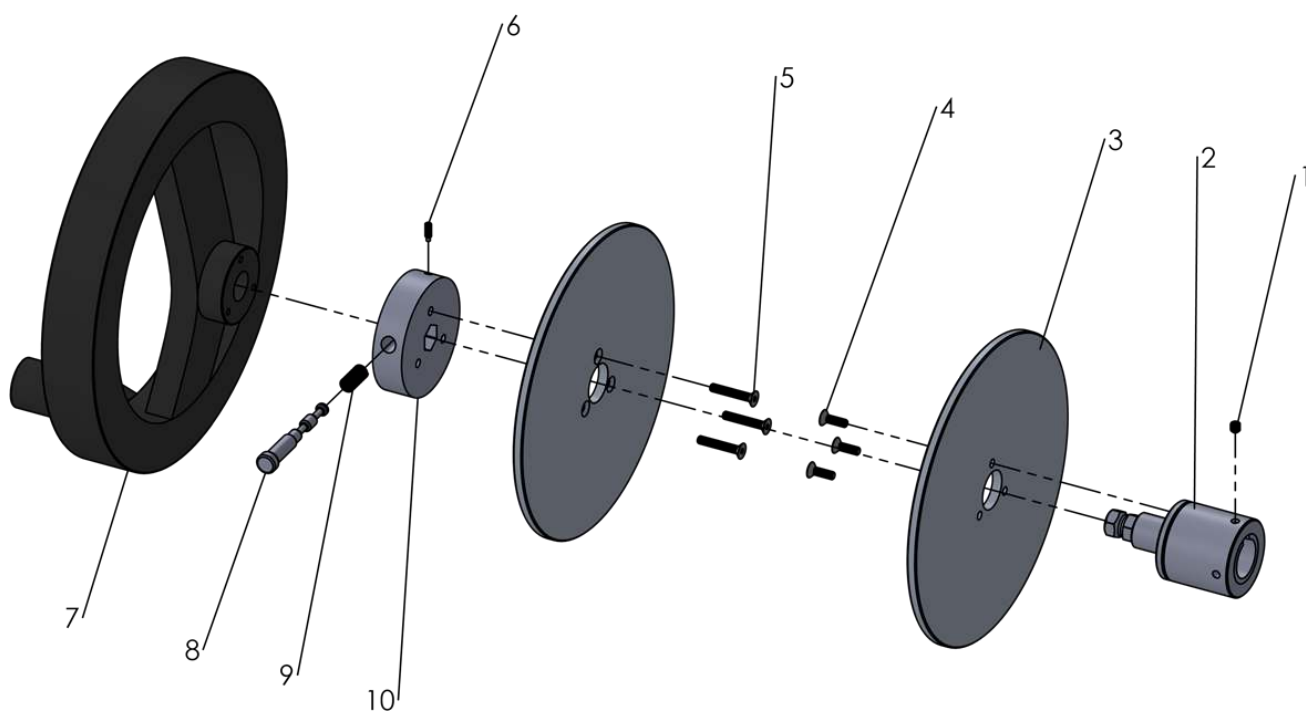


9500-108QR
NOTE: HAND WHEEL DETAIL
-SEE PAGE [65](#)

NOTE: LOWER ROLL DETAIL
-SEE PAGE [59](#)

HANDWHEEL DETAIL #9500-108QR				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	10465	SCREW - SET, M6 X 1.0P X 6MM	MCS# 92605A544	2
2	7000-972	ADAPTER - HEX HANDWHEEL		1
3	4500-203	PLATE - HANDWHEEL SAFETY		2
4	M5-16-FH	SCREW - M5 X 0.8P X 16MM FHCS	MCS# 91294A212	6
5	M5-30-FH	SCREW - M5 X 0.8P X 30MM FHCS	MCS# 92125A220	
6	1000-590	SCREW - SET, M4 X 0.7P X 12MM	MCS# 92905A091	1
7	4000-063QR	WHEEL - HAND CRANK	MCS# 60265K81	1
8	2500-111	PIN - SPRING, HANDWHEEL		1
9	7600-072	SPRING - 0.38OD X 0.75L	MCS# 9657K289	1
10	7000-605	BUSHING - QUICK RELEASE, HEX		1

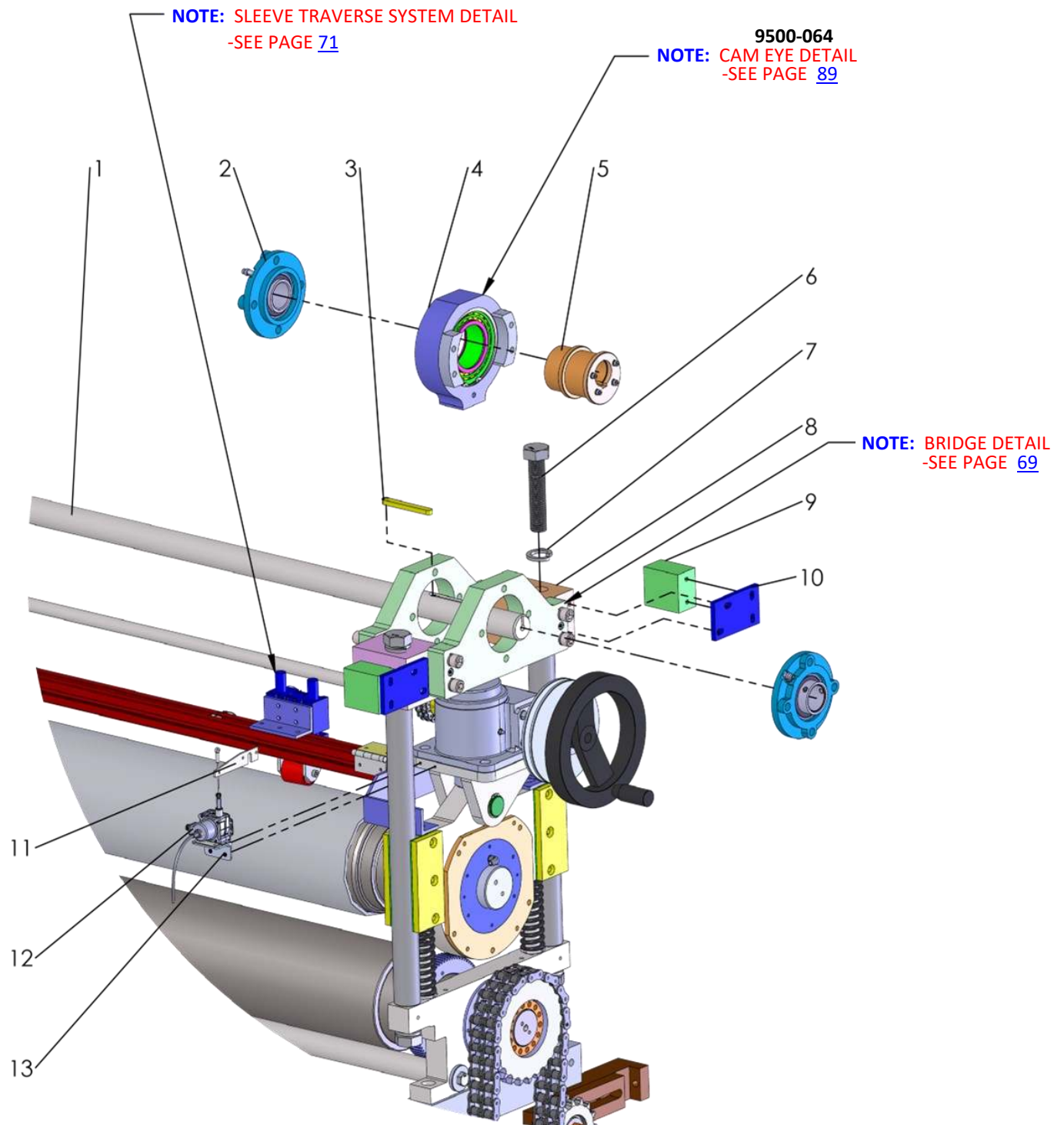
HAND WHEEL DETAIL



CAM BRIDGE DETAIL - OPERATOR SIDE				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	3000-159	SHAFT - ROLLER CAMSHAFT	RA-03	1
2	4500-046A	BEARING - CAM SHAFT FLANGE	PTI# UCFC210X50 W/ 6mm ELBOW	2
3	2500-079	KEY - 14mm X 9mm X 117mm		1
4	9500-064	ASSEMBLY - CAM EYE		1
5	4500-150AC	CAM - ROLLER LIFT WITH END CAP	RP37, RP38	1
6	M30-145-HH	SCREW - M30 X 3.5P X 145mm HHC	FC# 0121976	2
7	M30-SPL	WASHER - M30 SPLIT LOCK	MCS# 91202A263	2
8	7000-394	ASSEMBLY - BRIDGE		1
9	7000-937	SPACER - FISH PLATE BLOCK		2
10	7000-395	PLATE - BRIDGE SUPPORT MOUNT (FISH PLATE)	RP-01	2
11	7000-393	PLATE - POTENTIOMETER MOUNT	RA1-A	1
12	8501-182	POTENTIOMETER - STRING (RED LION READOUT)	MCS# 6863K1	1
13	7000-314	MOUNT - POTENTIOMETER ANGLE		1

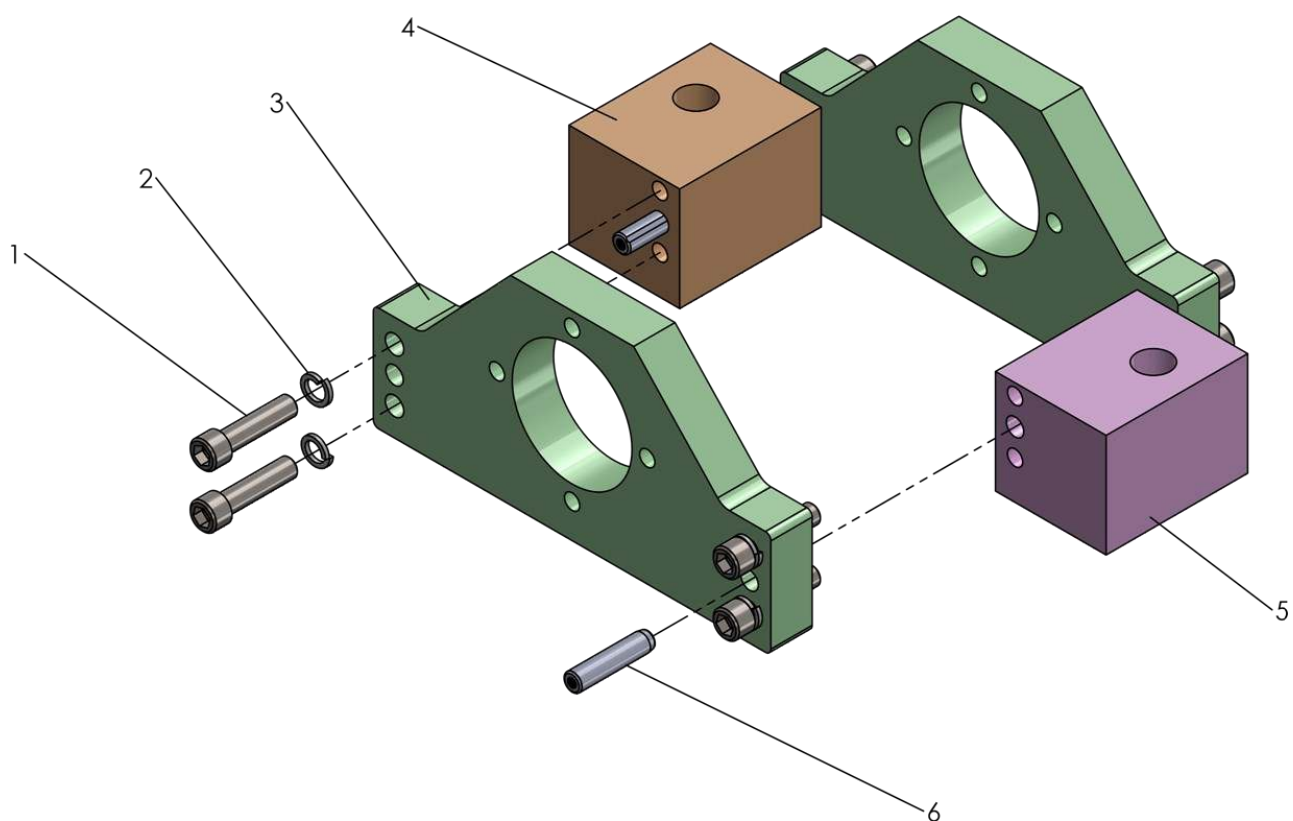
*12	8501-182	POTENTIOMETER - STRING (EXCOR TOUCH SCREEN)	ALLIED # TE CONNECTIVITY SPD-4-3	1
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CAM BRIDGE DETAIL - OPERATOR SIDE



BRIDGE DETAIL - OPERATOR SIDE				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	M16-65-SH	SCREW - M16 X 2.0P X 65mm SHCS	MCS# 91290A835	8
2	2000-117	WASHER - M16 SPLIT LOCK	MCS# 91190A590	8
3	7000-469	PLATE - CAMSHAFT BEARING BRIDGE ... (TAP HOLES)		2
4	7000-468	BLOCK - CAMSHAFT BEARING RIGHT		1
5	7000-467	BLOCK - CAMSHAFT BEARING LEFT		1
6	2500-087	PIN - 16mm OD X 70mm LONG, DOWEL	MCS# 98432A398	4

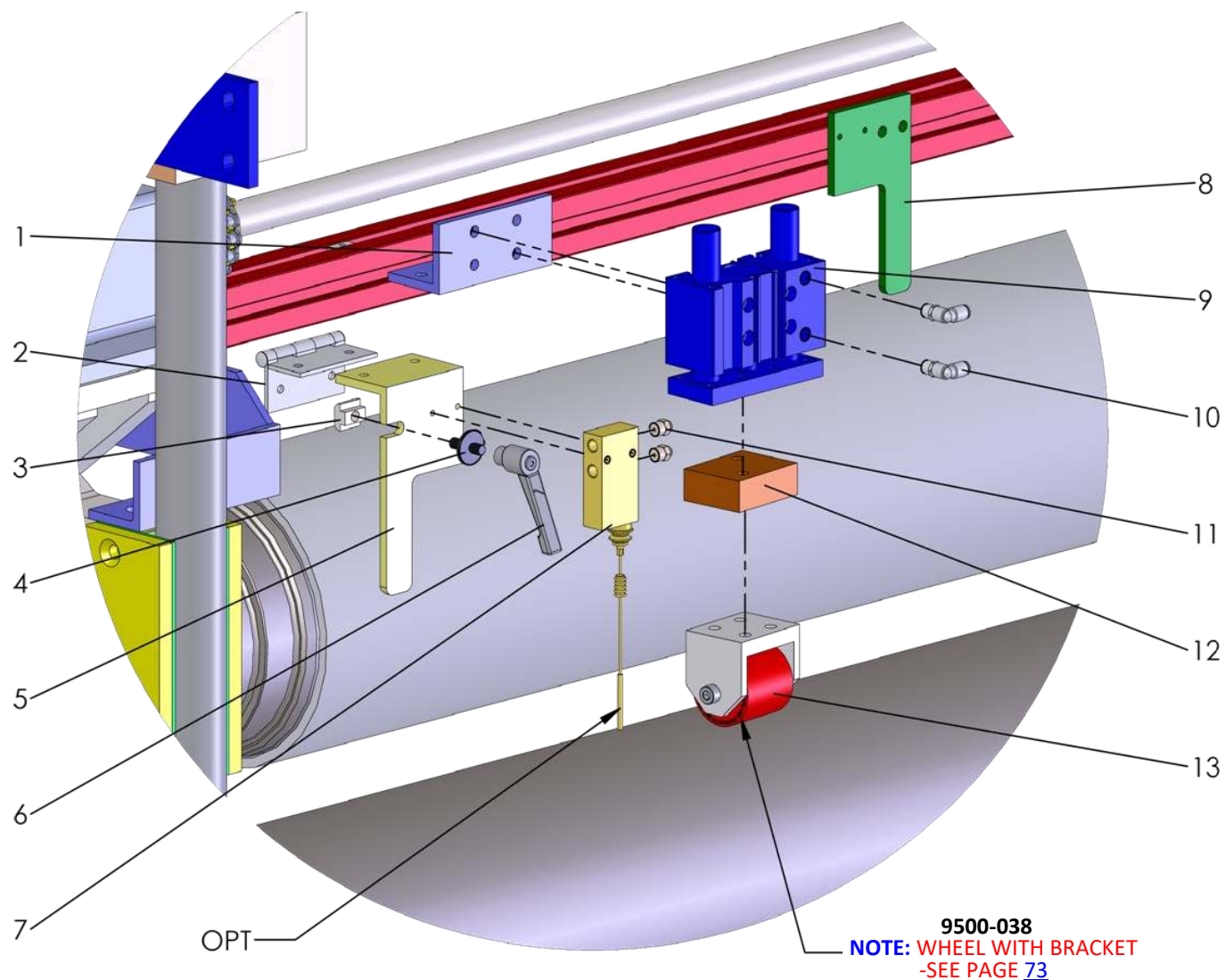
BRIDGE DETAIL - OPERATOR SIDE



SLEEVE TRAVERSE SYSTEM DETAIL				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	7000-377	BRACKET - ANGLE, GUIDE CYLINDER	SL4-A	2
2	4000-059	HINGE - FESTO SWITCH MOUNT, OPERATOR SIDE	MCS# 1581A144	1
3	1500-042	NUT - M8 X 1.25P SLIDE IN T-NUT	80/20# 45-13049	11
4	1000-454	STUD - ADJUSTABLE HANDLE		1
5	7000-224	BRACKET - FESTO SWITCH MOUNT, OPERATOR SIDE		1
6	4000-058	HANDLE - ADJ POSITION W/ THREADED HOLE	MCS# 60235K64	1
* 7	7600-005	SWITCH - VALVE WITH WHISKER, LIMIT	AS# FESTO - 3876-FVS-3-1/8	2
8	7000-267	BRACKET - FESTO SWITCH MOUNT, SPRAG SIDE		1
9	4200-020	CYLINDER - GUIDE	SMC# MGPM32N-25	2
10	3500-205	ELBOW - 4mm X 1/8 RPT	SMC# KQ2L04-01AS	4
11	3500-203	STRAIGHT - 4mm X 1/8 RPT	SMC# KQ2H04-01AS	4
12	7000-263	PLATE - SPACER	SL5-A	2
13	9500-038	ASSEMBLY - WHEEL WITH BRACKET	SL5-A	2

* OPT	7600-007	SPRING - WHISKER ONLY	... (Replaceable part)	AS# FESTO - 101313 WHISKER FVS-3-1/8	2
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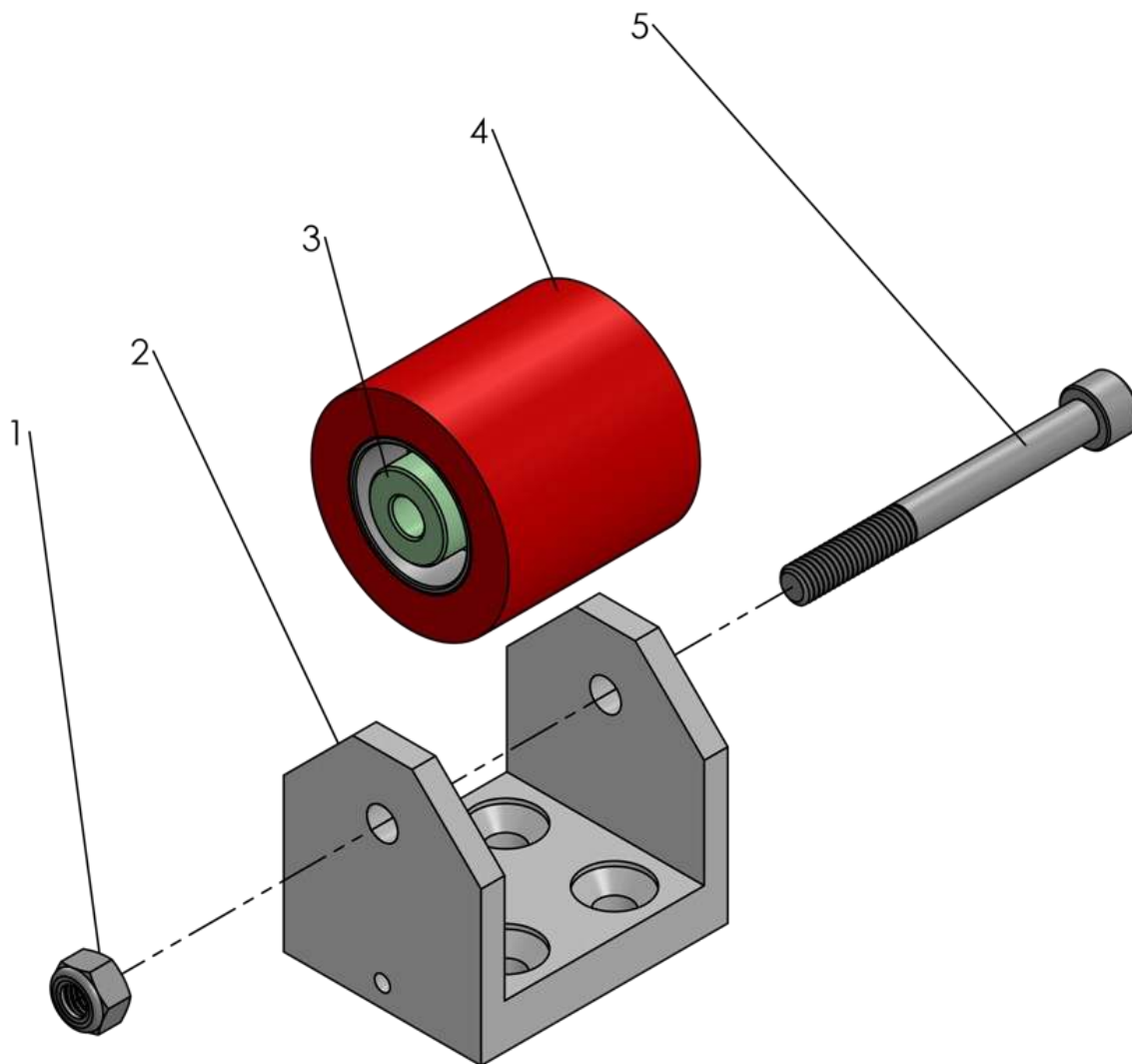
SLEEVE TRAVERSE SYSTEM DETAIL



NOTE: AIR SYSTEM SCHEMATICS
-SEE PAGE [165](#)

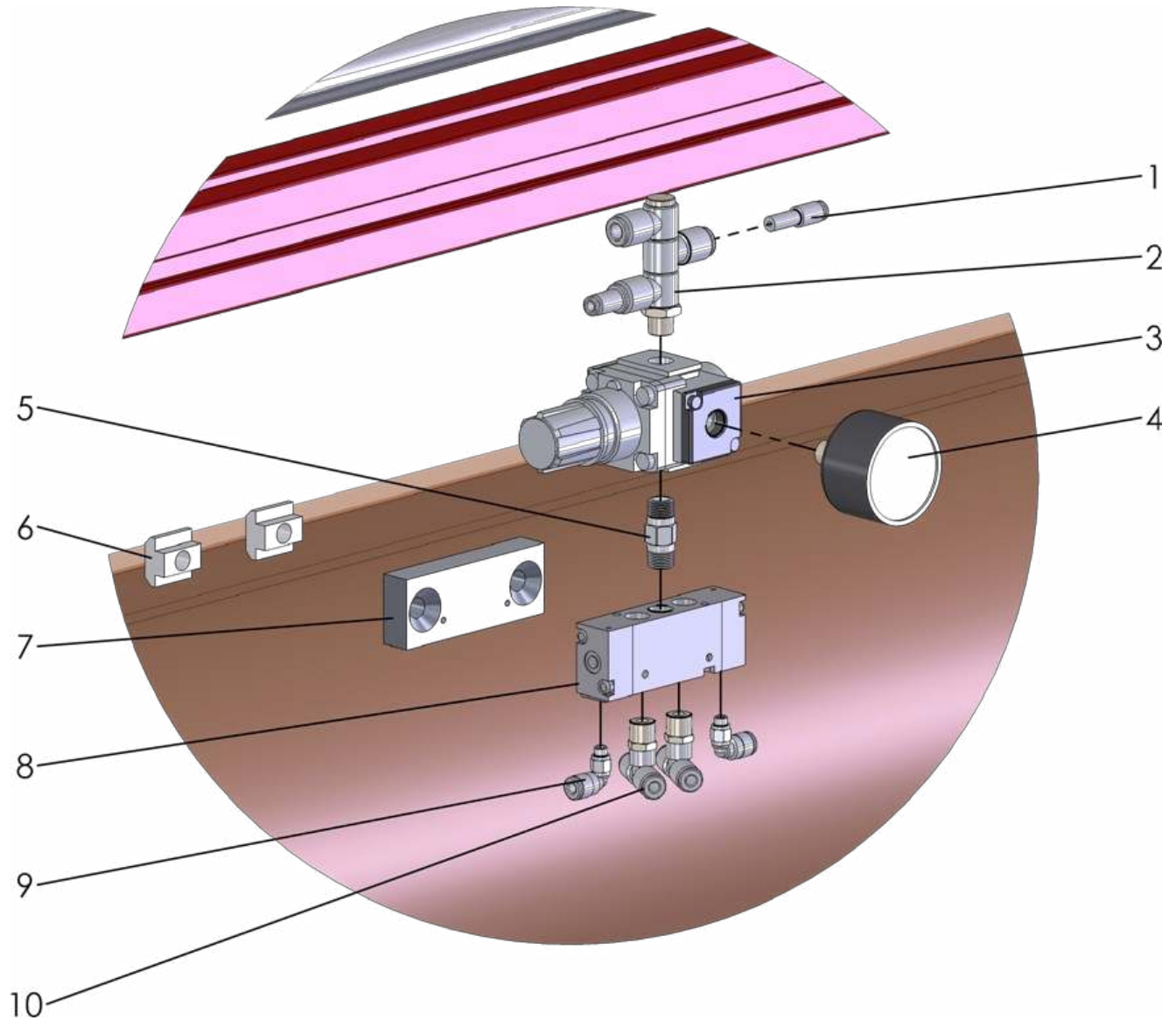
TRAVERSE WHEEL ASSEMBLY #9500-038				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	M8 NYL	NUT - M8 X 1.25P NYLOC	MCS# 90576A117	1
2	7000-203	BRACKET - SLEEVE TRAVERSE		1
3	2000-075	SPACER - TRAVERSE WHEEL		2
4	4000-051	SLEEVE - TRAVERSE WHEEL	FP# RR - 2020-80UR R	1
5	M8-75-SH	SCREW - M8 X 1.25P X 75mm SHCS	MCS# 91290A461	1

TRAVERSE WHEEL ASSEMBLY



TRAVERSE AIR REGULATOR DETAIL				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	3500-219	REDUCER - 6mm to 4 mm PLUG IN	SMC# KQ2R04-06A	2
2	3500-220	ELBOW - 6mm X 6mm X 6mm X 1/8 RPT, TRIPLE	SMC# KQ2VT06-01AS	1
3	7600-037	REGULATOR - PRESSURE, 1/8 RPT PORTS	SMC# AR20-01-B	1
4	7600-036	GAUGE - PRESSURE	SMC# K40-MP1.0-01MS	1
5	3500-006	NIPPLE - 1/8 BSPT, BRASS	MCS# 4860K631	1
6	1500-042	NUT - M8 X 1.25P SLIDE IN T-NUT	80/20# 45-13049	2
7	7000-401	PLATE - MOUNT		1
8	7600-006	VALVE - AIR	SMC# SYJA7220-01	1
9	3500-214	ELBOW - 4mm X M5 X 0.8P	SMC# KQ2L04-M5A	2
10	3500-207	TEE - 4mm X 1/8 RPT, BRANCH	SMC# KQ2T04-01AS	2

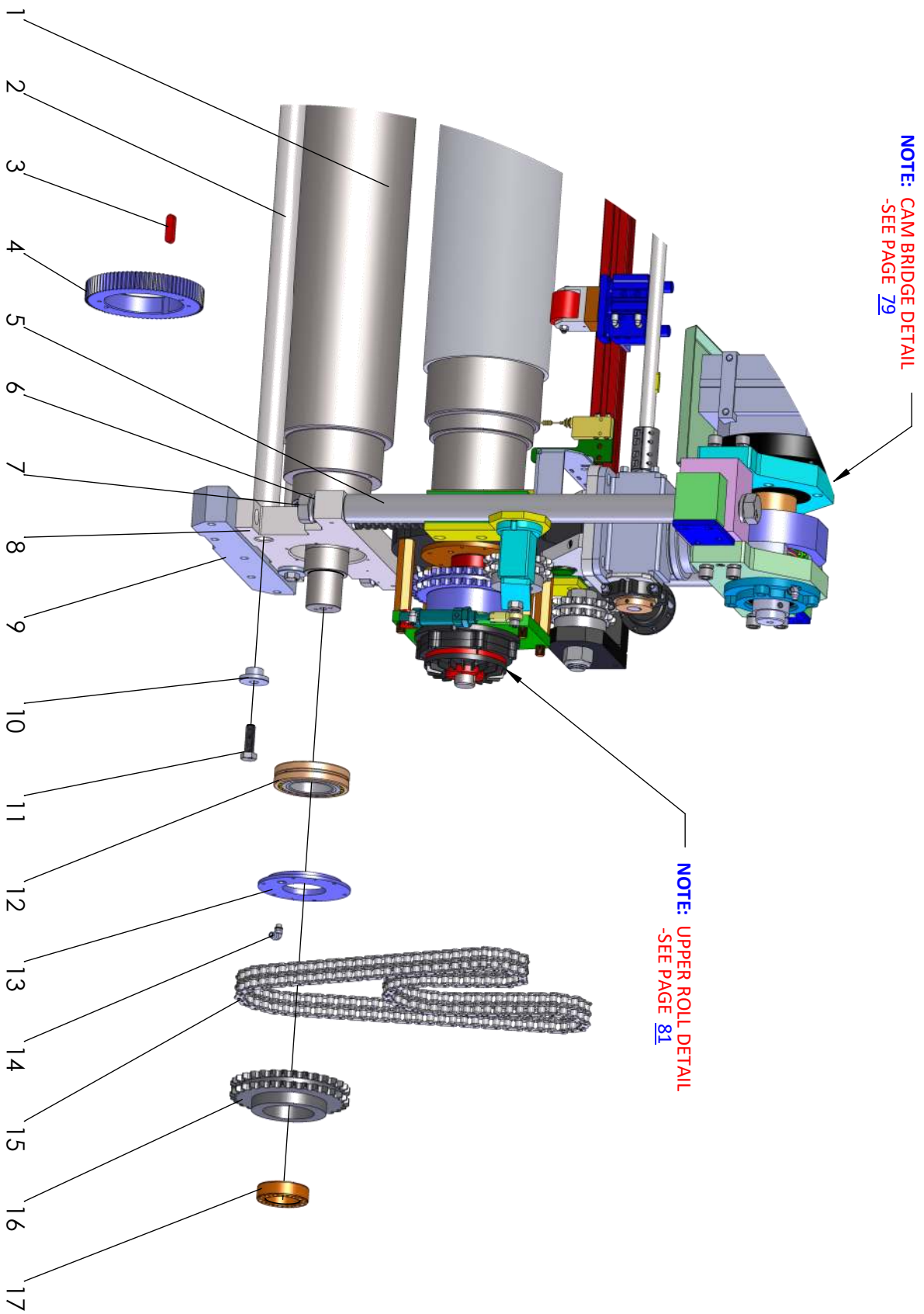
TRAVERSE AIR REGULATOR DETAIL



NOTE: SEE PAGE [165](#)
FOR AIR SCHEMATICS

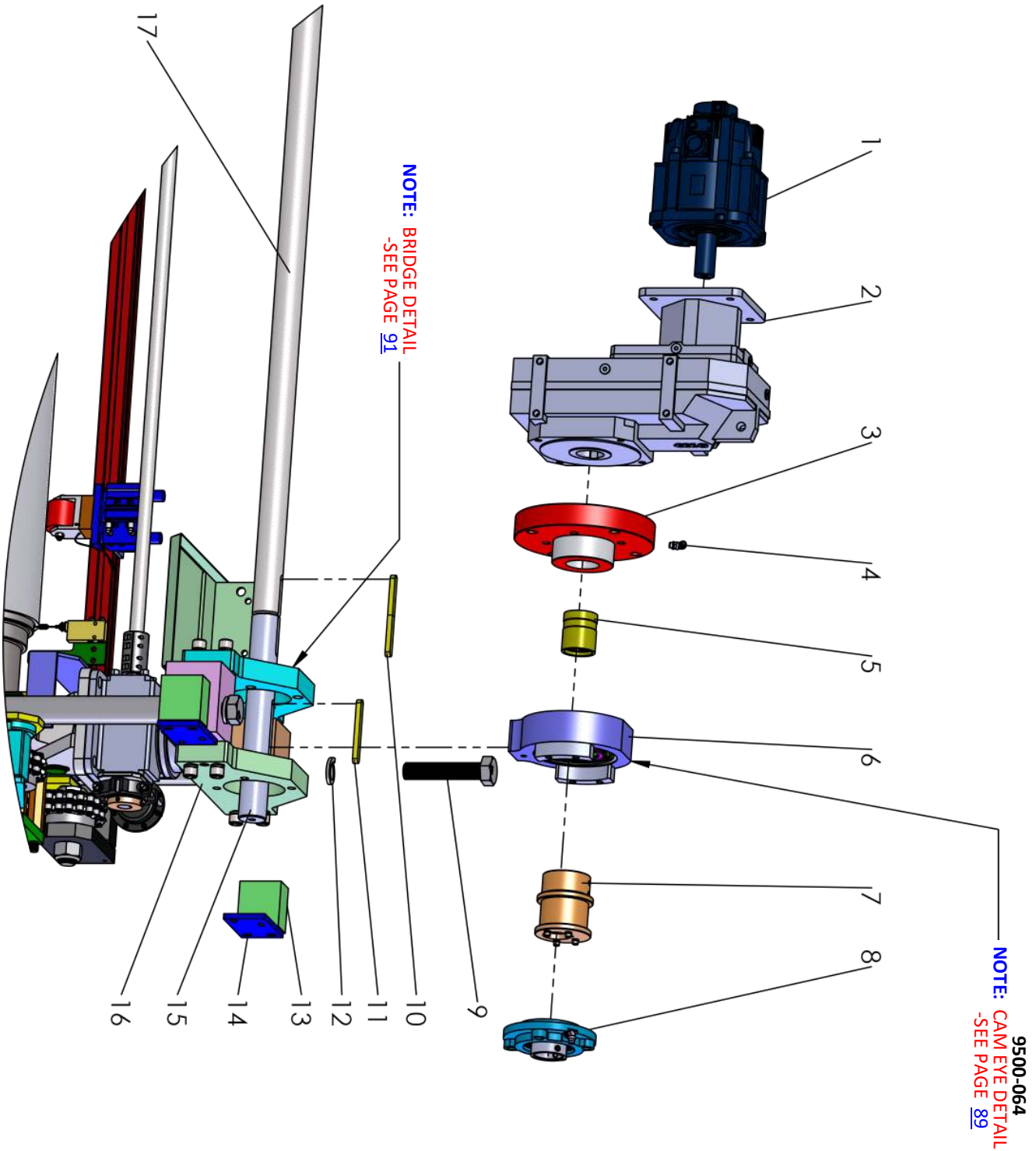
LOWER ROLL DETAIL - SPRAG SIDE				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	4000-147	ROLLER - LOWER		1
2	3000-157	BAR - TIE	RA-39	2
3	2500-074	KEY - 14mm X 9mm X 50mm		1
4	4500-152	GEAR - 80T, 2.5P MOD SPUR (SOLD AS MATCH SET)	EGI# 2.5 MODULE 80T 20PA 30.35FW	1
5	3000-085	SHAFT - 50mm SLIDE	RP-63	2
6	M30-SPL	WASHER - M30 SPLIT LOCK	MCS# 91202A263	2
7	M30-105-HH	SCREW - M30 X 3.5P X 105mm HHC	FC# 0121976	2
8	4500-224	HOUSING - LOWER ROLL BEARING	RP-24	1
9	10431	BLOCK - ROLLER MOUNT - HYBRID	RP-77	1
10	4500-225	BUSHING - BOLT WASHER		2
11	M16-50-HH	SCREW - M16 X 2.0P X 50mm HHC	MCS# 91280A844	2
12	4500-131	BEARING - ROLLER	SKF# 22215E	2
13	4500-210	RETAINER - LOWER ROLLER BEARING	RP-07	1
14	3500-060	ELBOW - 6mm X 1/8 BSPP, GREASE FITTING	MSC# 08037285	1
15	5000-045	CHAIN - SPRAG	TSUBAKI 3/4in DUPLEX CHAIN - 122 PINS	1
16	10584	SPROCKET - LOWER DRIVE	EGI# 12B-2-32B	1
17	4500-191	BUSHING - 60mm ID X 90mm OD, RINGFEDER	RF# RFN7012 60X90	1

LOWER ROLL DETAIL - SPRAG SIDE



CAM BRIDGE DETAIL - SPRAG SIDE				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	7500-053	MOTOR - CAM LIFT DRIVE	BBTI# YASKAWA - SGMGV-44D3A6C 02	1
2	7500-050	GEAR - WATT DRIVE UNIT	BBTI# ASA 76A SA180/35/KL	1
3	4500-202	ADAPTER - CAM LIFT SERVO MOTOR BOSS		1
4	3500-060	ELBOW - 6mm X 1/8 BSPP, GREASE FITTING	MSC# 08037285	1
5	4500-134	BUSHING - ROLLER LIFT	RB# 7194	1
6	9500-064	ASSEMBLY - CAM EYE		1
7	4500-150AC	CAM - ROLLER LIFT WITH END CAP	RP37, RP38	1
8	4500-046A	BEARING - CAM SHAFT FLANGE	PTI# UCFC210X50 W/ 6mm ELBOW	1
9	M30-145-HH	SCREW - M30 X 3.5P X 145mm HHC	FC# 0121976	2
10	2500-095	KEY - 14mm X 9mm X 75mm		2
11	2500-079	KEY - 14mm X 9mm X 117mm		1
12	M30-SPL	WASHER - M30 SPLIT LOCK	MCS# 91202A263	2
13	7000-937	BLOCK - SPACER		2
14	7000-395	PLATE - BRIDGE SUPPORT MOUNT (FISH PLATE)	RP-01	2
15	3000-121	SHAFT - ROLLER CAM, SHORT		1
16	7000-480	ASSEMBLY - BRIDGE		1
17	3000-159	SHAFT - ROLLER CAMSHAFT		1

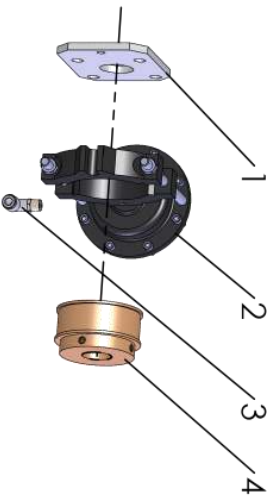
CAM BRIDGE DETAIL - SPRAG SIDE



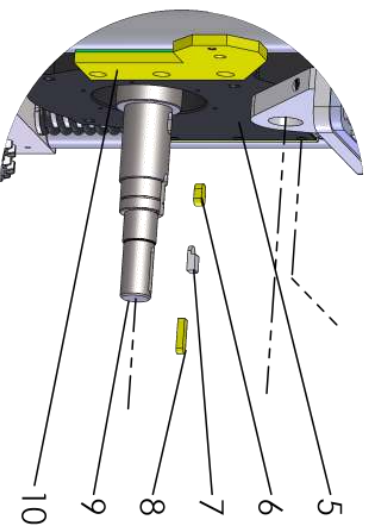
UPPER ROLL DETAIL - SPRAG SIDE				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	7000-236	PLATE - ANVIL BRAKE MOUNT		1
2	9000-030	BRAKE - HAND WHEEL	TM# NEXEN - 841600	1
3	3500-306	ELBOW - 6mm X 1/8 RPT	SMC# KQ2L06-01AS	1
4	9000-040	DRUM - HAND WHEEL BRAKE	TM# NEXEN - 842300	1
5	4500-223	HOUSING - UPPER ROLL BEARING, SPRAG	RP-50	1
6	2500-072	KEY - 14mm X 9mm X 26mm		1
7	2500-038	KEY - 14mm X 9mm X 30.1mm, STEP		1
8	2500-073	KEY - 10mm X 8mm X 45mm		1
9	4000-146	ROLLER - UPPER		1
10	7000-392	PLATE - OUTER, FIXED	RP-60	1
11	7000-240	PLATE - SLIDE BEARING		4
12	7000-389	PLATE - OUTER	RP-60-2	2
13	4500-137	BUSHING - NOOK CLEVIS	AMM - A40-50 X 60mm	1
14	3000-110	SHAFT - NOOK CLEVIS	R9-40	1
15	2500-036	RING - 40mm EXT, RETAINING	MCS# 98541A156	2
16	2500-037	RING - 50mm EXT, RETAINING	MCS# 98541A167	1
17	2000-039	STANDOFF - AIR BRAKE	SPRAG-2	4
18	7000-390	PLATE - MOUNTING, AIR BRAKE	SPRAG-1	1
19	9000-006	BRAKE - ONE-WAY CLUTCH	TM# NEXEN - 820601, MODEL T-600	1
20	4500-066	BUSHING - QD	TM# WOD SH 35mm QD	1
21	5000-045	CHAIN - SPRAG	TSUBAKI 3/4in DUPLEX CHAIN - 122 PINS	1
22	2000-098	SPACER - THRUST SUPPORT		1
23	4500-205	RETAINER - UPPER ROLLER BEARING		1
24	4500-131	BEARING - ROLLER	SKF# 22215E	1
25	7600-028	SHAFT - HD SPRING LOCATOR		2
26	7600-027	SPRING - HEAVY DUTY	FVSC# FV0024622REV	2
27	2000-040	SPACER - NYOIL		2
28	7000-391	PLATE - INNER WITH TAPER		1
29	4000-038	SLEEVE - ANVIL	8in X 74in COMMON	1
30	10233	BRACKET - TRAVERSE BAR MOUNT, UNIVERSAL	SL4-B	1
31	7000-396	BRACKET - NOOK, CLEVIS	RP-39	1
32	7500-034	JACK - NOOK, METRIC ACTION	NOOK# EM10AB-MSJ-U 24:1 10-TON	1
33	3000-160	BAR - TRAVERSE	80/20# 45-4545 X 2157mm	1
34	3000-158	SHAFT - NOOK, CONNECTING		1
35	4500-217	COUPLING - 25mm ID	WBT# 2MISCC-25-25-KW	1

UPPER ROLL DETAIL - SPRAG SIDE

NOTE: CAM BRIDGE DETAIL
-SEE PAGE [79](#)

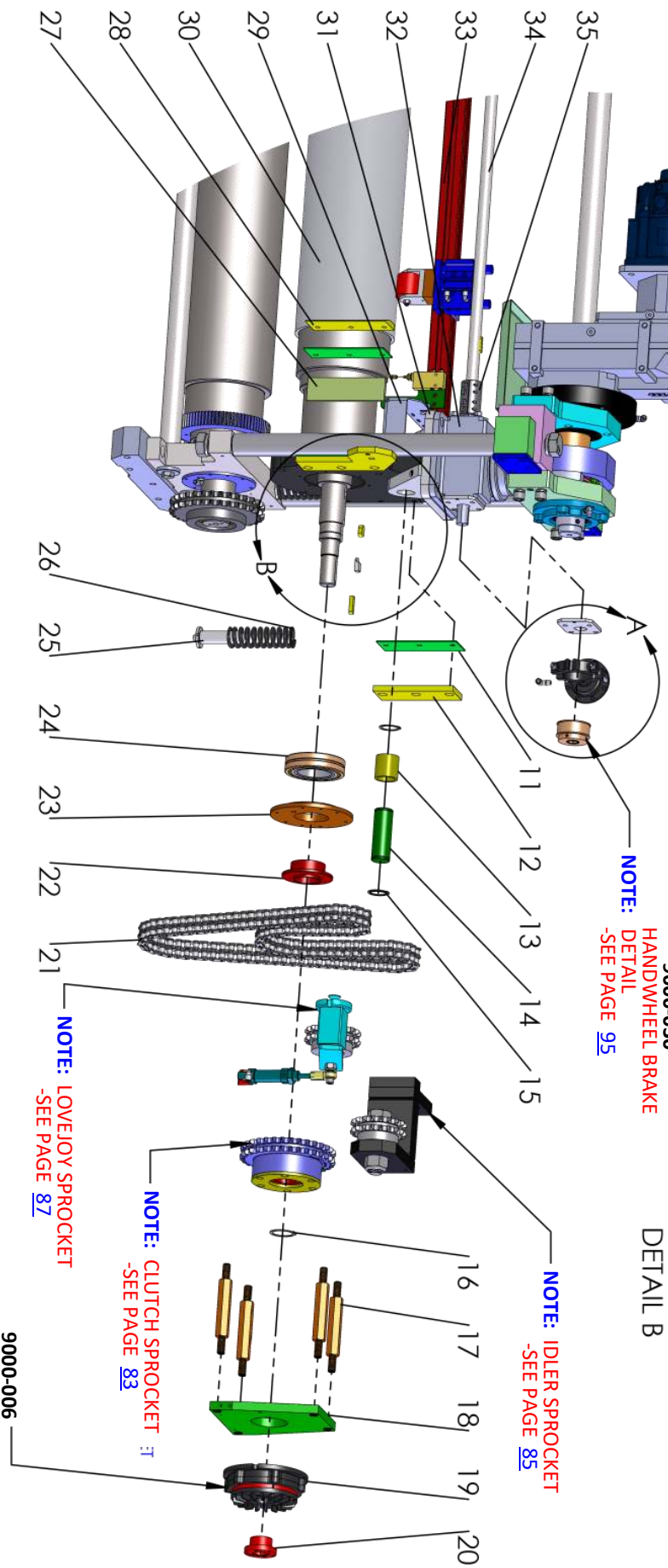


DETAIL A



DETAIL B

9000-030
HANDWHEEL BRAKE
NOTE: DETAIL
-SEE PAGE [95](#)



NOTE: LOVEJOY SPROCKET
-SEE PAGE [87](#)

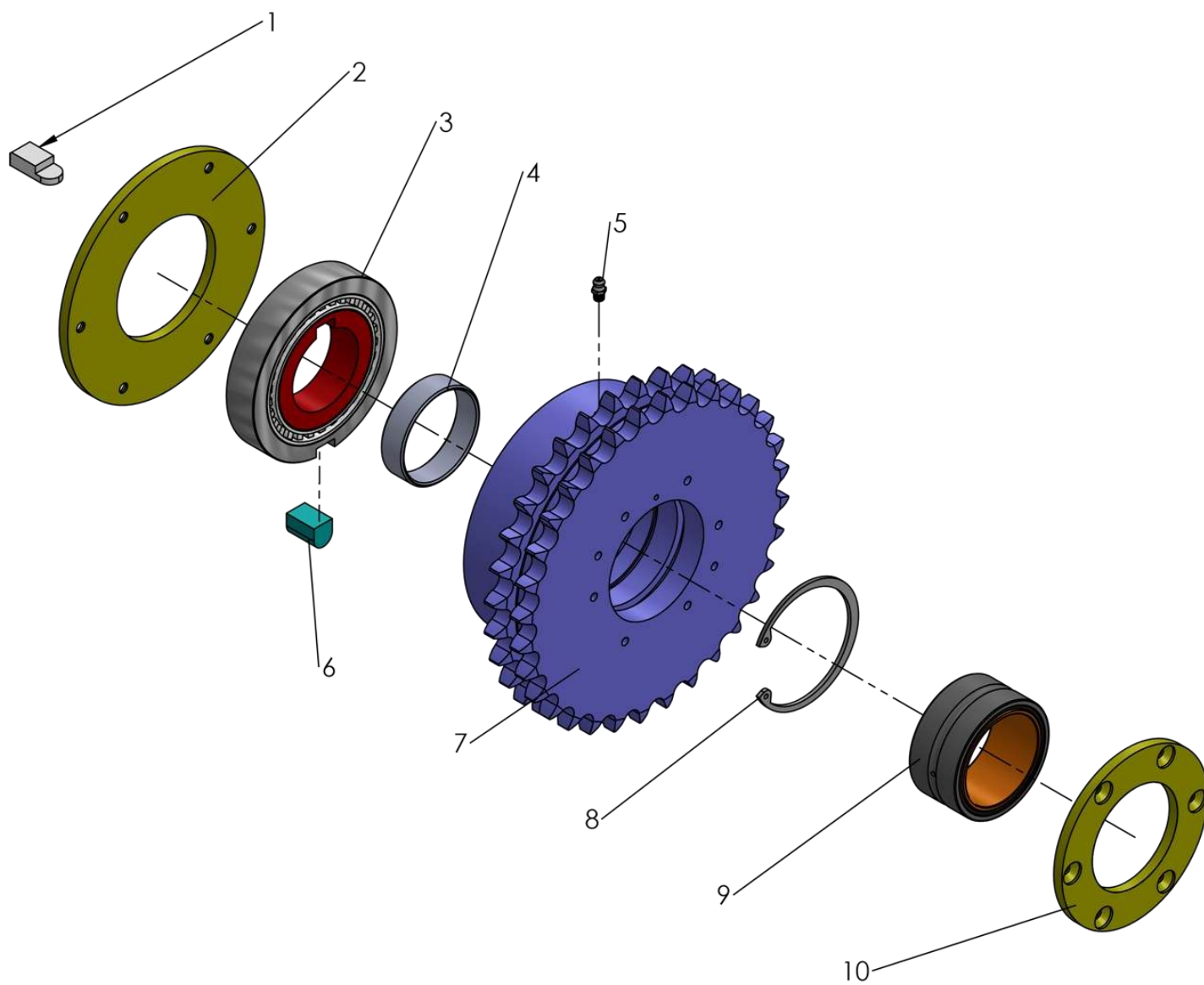
NOTE: CLUTCH SPROCKET
-SEE PAGE [83](#)

NOTE: IDLER SPROCKET
-SEE PAGE [85](#)

9000-006
ANVIL BRAKE
NOTE: DETAIL
-SEE PAGE [93](#)

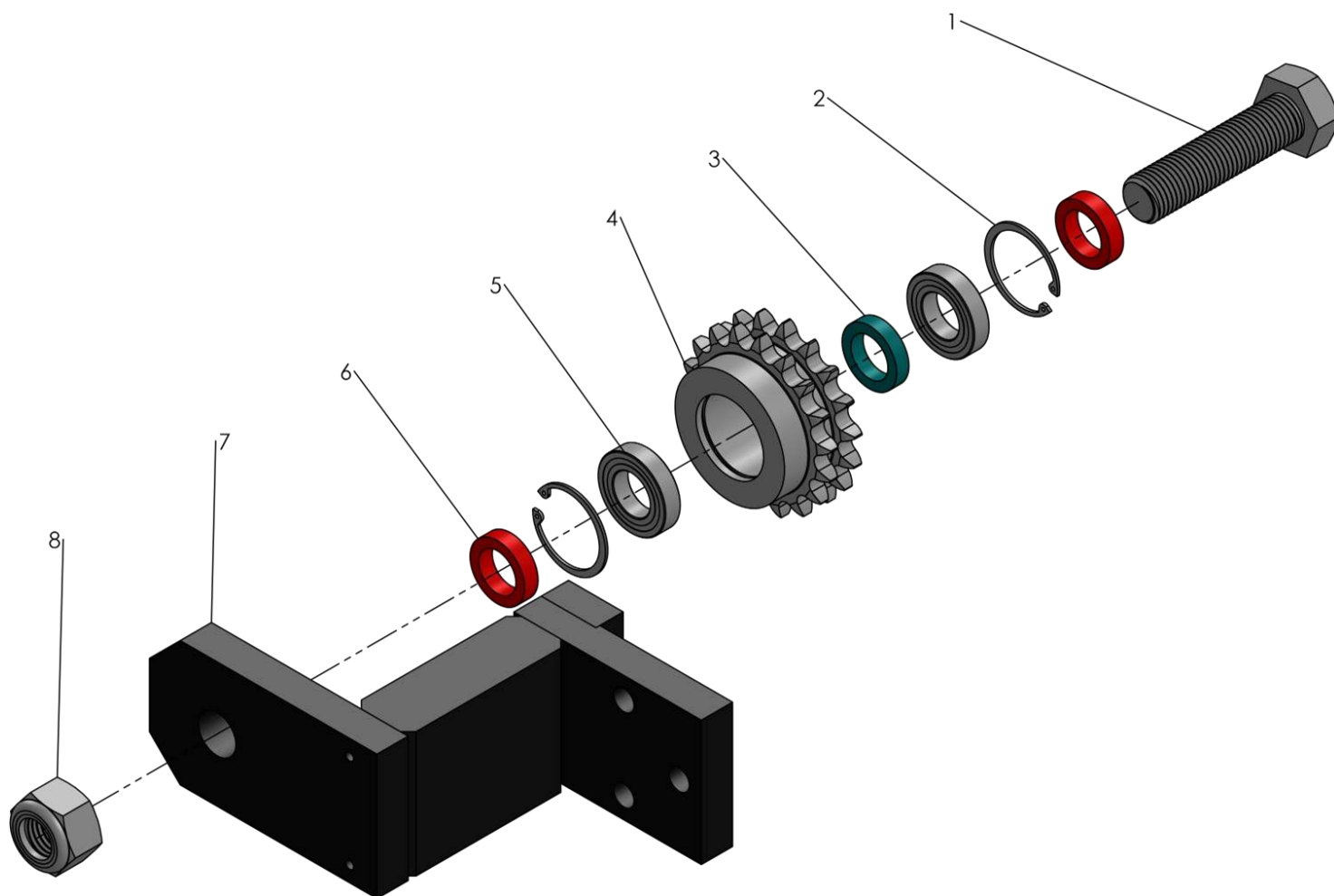
SPRAG CLUTCH SPROCKET DETAIL				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	2500-038	KEY - 14mm X 9mm X 30.1mm, STEP		1
2	7000-145	PLATE - CLUTCH RETAINER	PHOSPHOR BRONZE	1
3	9500-026	BEARING - ONE WAY CLUTCH ASSEMBLY		1
4	2000-070	SPACER - 16.5mm WIDE, BEARING	RA-27	1
5	3500-038	STRAIGHT - M6 X 1.0P, GREASE FITTING	MCS# 1105K71	1
6	2500-033	KEY - 14mm X 16mm X 21mm		1
7	4500-199	SPROCKET - SPRAG	EGI# D12B34	1
8	2500-061	RING - 3.121in INT, RETAINING	MCS# 99142A645	1
9	4500-127	BEARING - NEEDLE WITH RACE	BDI# INA NKI 55/35	1
10	7000-144	PLATE - SPROCKET RETAINER	PHOSPHOR BRONZE	1

SPRAG CLUTCH SPROCKET DETAIL



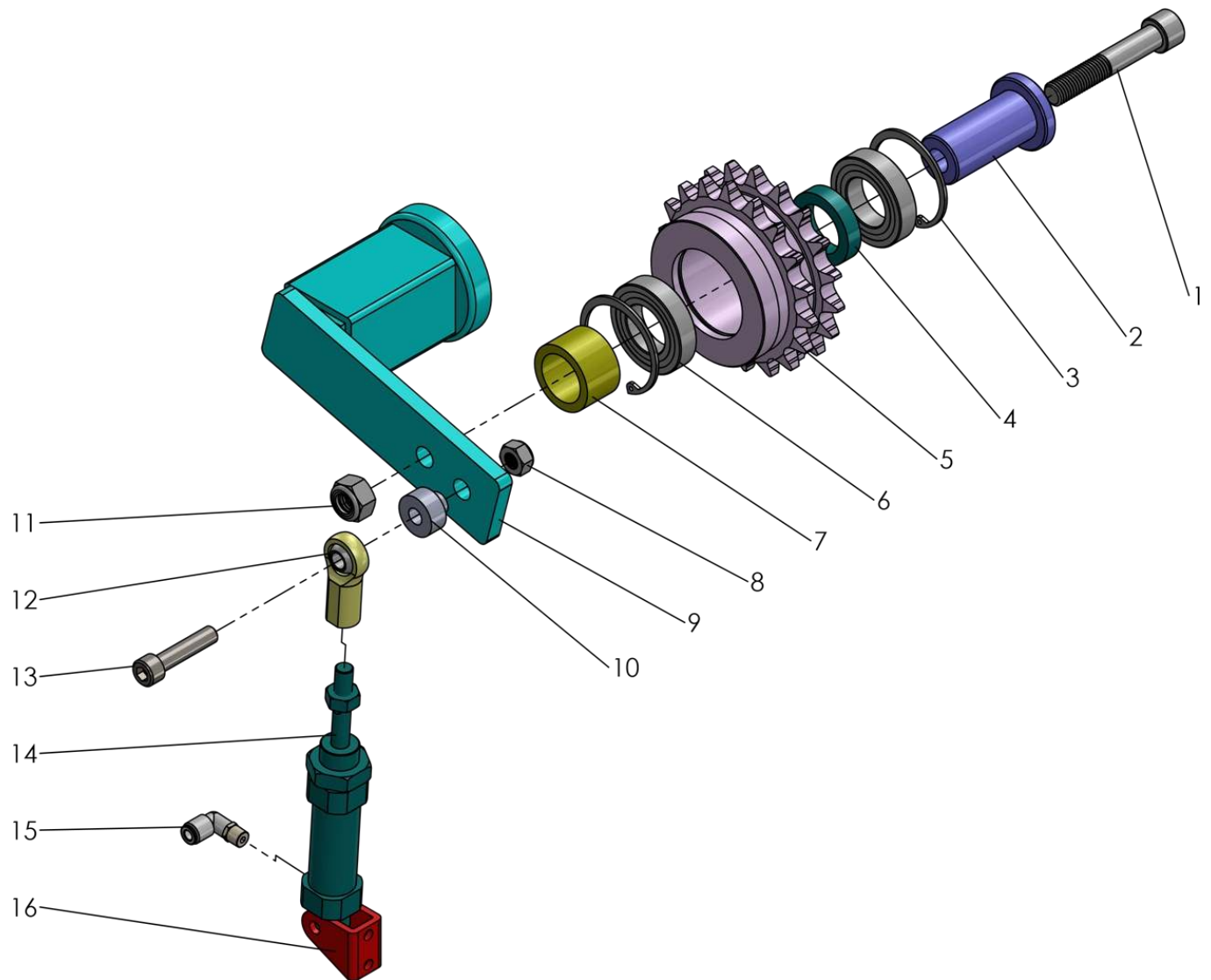
SPRAG IDLER SPROCKET DETAIL				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	M30-120-HH	SCREW - M30 X 3.5P X 120mm HHC	FC# 35154	1
2	2500-058	RING - 55mm INT, RETAINING	MCS# 98455A144	2
3	2000-052	SPACER - 10mm WIDE, IDLER BEARING		1
4	4500-197	SPROCKET - SPRAG	PTI# D12B18	1
5	4500-146	BEARING - 55mm X 30mm X 13mm, RADIAL BALL	SKF# 6006-2RSJEM	2
6	2000-053	SPACER - 11mm WIDE, IDLER BEARING		2
7	7000-938	BRACKET - IDLER, SPRAG		1
8	M30 NYL	NUT - M30 X 3.5P NYLOC	MCS# 93520A229	1

SPRAG IDLER SPROCKET DETAIL



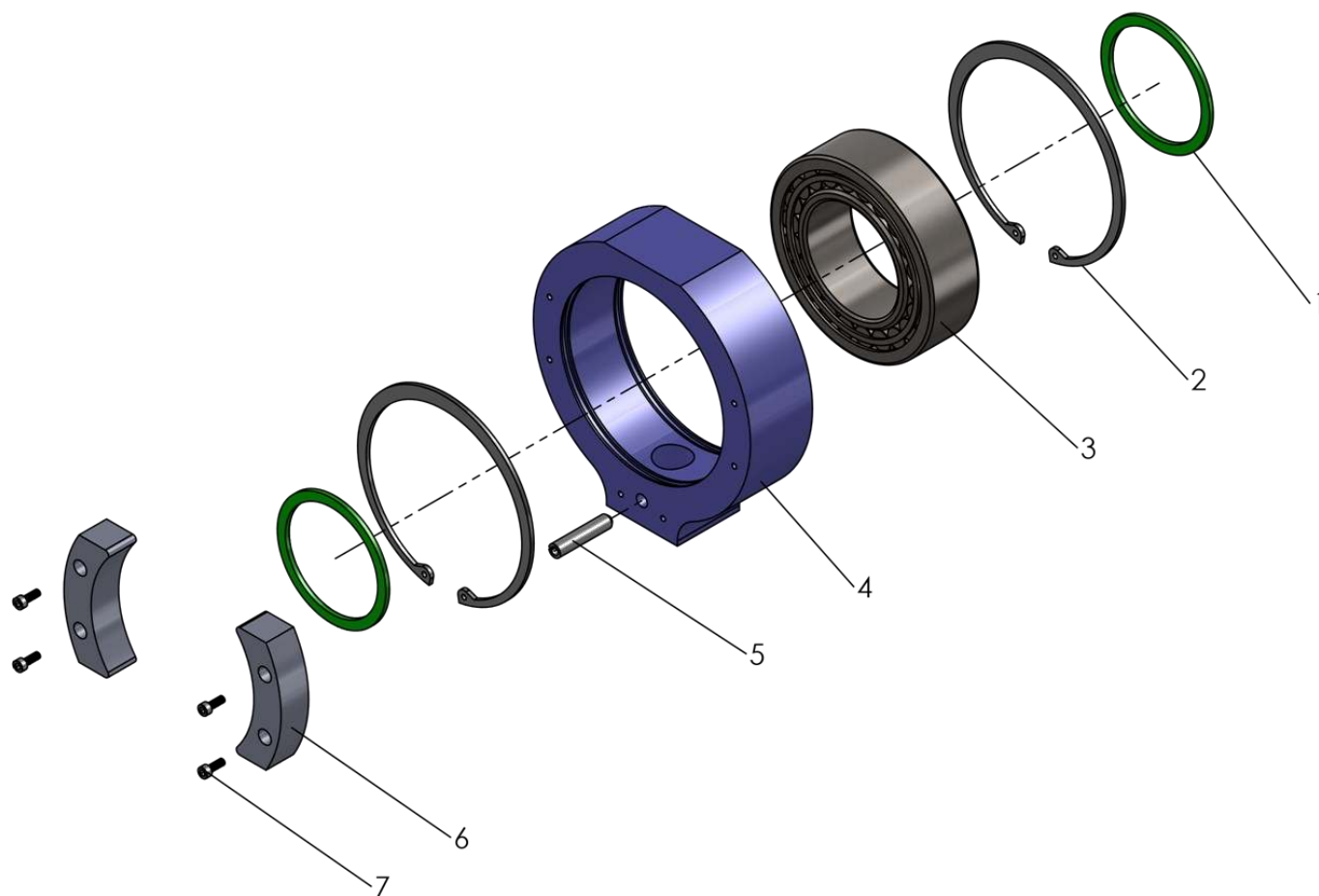
LOVEJOY SPROCKET DETAIL				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	M14-80-FH	SCREW - M14 X 2.0P X 80mm SHCS	MCS# 91290A765	1
2	4500-170	BUSHING - IDLER, SPRAG SIDE		1
3	2500-058	RING - 55mm INT, RETAINING	MCS# 98455A144	2
4	2000-052	SPACER - 10mm WIDE, IDLER BEARING		1
5	4500-197	SPROCKET - SPRAG	PTI# D12B18	1
6	4500-146	BEARING - 55mm X 30mm X 13mm, RADIAL BALL	SKF# 6006-2RSJEM	2
7	2000-074	SPACER - 25.4mm WIDE, IDLER BEARING		1
8	M10 NYL	NUT - M10 X 1.5P NYLOC	MCS# 90576A118	1
9	5000-042	TENSIONER - LOVEJOY	ROSTA# SE27 LOVEJOY	1
10	2000-099	SPACER - LOVEJOY		1
11	M14-NYL	NUT - M14 X 2.0P NYLOC	MCS# 90576A147	1
12	4500-163	JOINT - ROD END	SMC# KJ10DM10X1.25	1
13	M10-45-SH	SCREW - M10 X 1.5P X 45mm SHCS	MCS# 91290A530	1
14	4200-016	CYLINDER - CHAIN TENSIONER, SPRAG	SMC# CD85N25-25-B	1
15	3500-306	ELBOW - 6mm X 1/8 RPT	SMC# KQ2L06-01AS	1
16	7000-218	BRACKET - CHAIN TENSIONER, SPRAG	SMC# C85C25	1

LOVEJOY SPROCKET DETAIL



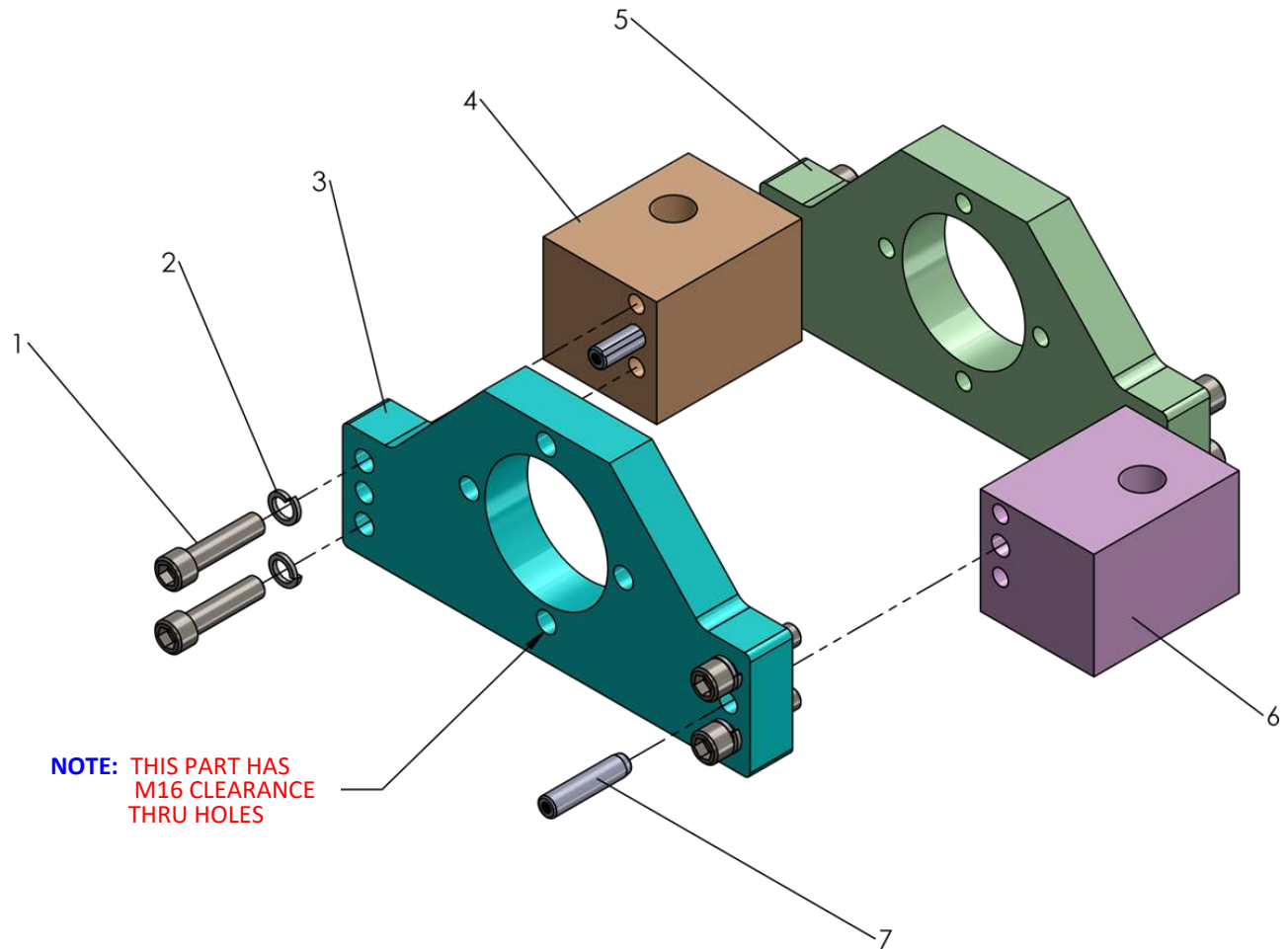
CAM EYE DETAIL #9500-064				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	2000-049	SPACER - 85mm ID X 100mm OD X 7mm THICK		2
2	2500-048	RING - 150mm INT, RETAINING	FC# 4115868	2
3	4500-192	BEARING - ROLLER	SKF# BS2-2217-2RS\VT143	1
4	3000-087	HOUSING - BEARING, EYELET		1
5	2500-088	PIN - 10mm OD X 50mm LONG, ROLL	MCS# 91611A615	1
6	7000-266	BLOCK - ANTI-TWIST		2
7	M5-14-SH	SCREW - M5 X 0.8P X 14mm SHCS	MCS# 92290A230	4

CAM EYE DETAIL

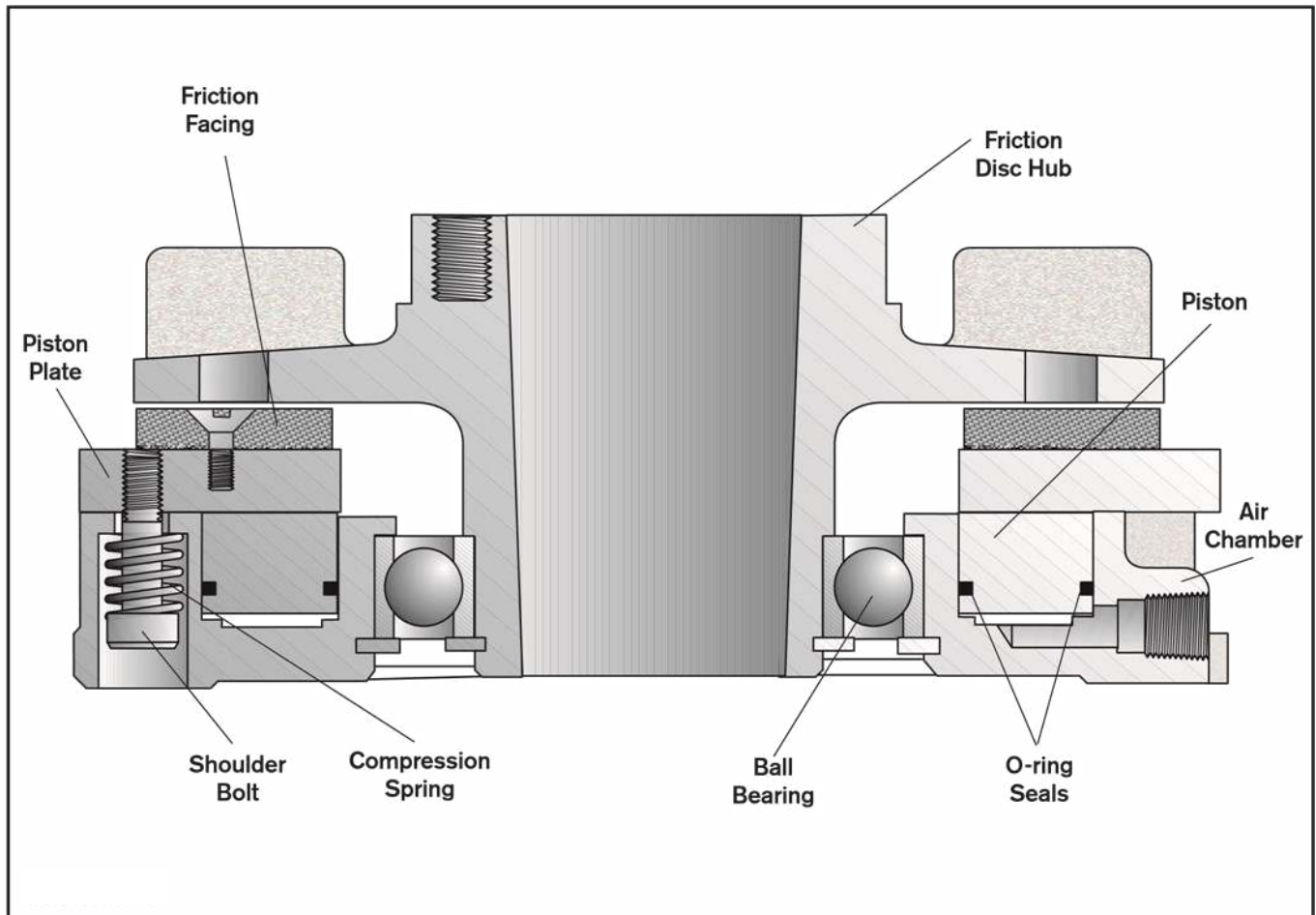


BRIDGE DETAIL - SPRAG SIDE				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	M16-65-SH	SCREW - M16 X 2.0P X 65mm SHCS	MCS# 91290A835	8
2	2000-117	WASHER - M16 SPLIT LOCK	MCS# 91190A590	8
3	7000-470	PLATE - CAMSHAFT BEARING BRIDGE ... (THROUGH HOLES)		1
4	7000-468	BLOCK - CAMSHAFT BEARING RIGHT		1
5	7000-469	PLATE - CAMSHAFT BEARING BRIDGE ... (TAP HOLES)		1
6	7000-467	BLOCK - CAMSHAFT BEARING LEFT		1
7	2500-087	PIN - 16mm OD X 70mm LONG, DOWEL	MCS# 98432A398	4

BRIDGE DETAIL - SPRAG SIDE

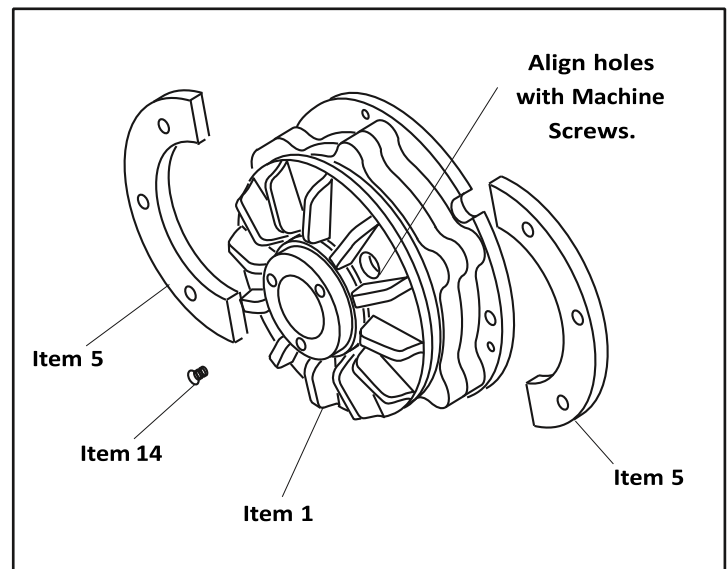


ANVIL BRAKE (SPRAG SIDE) DETAIL

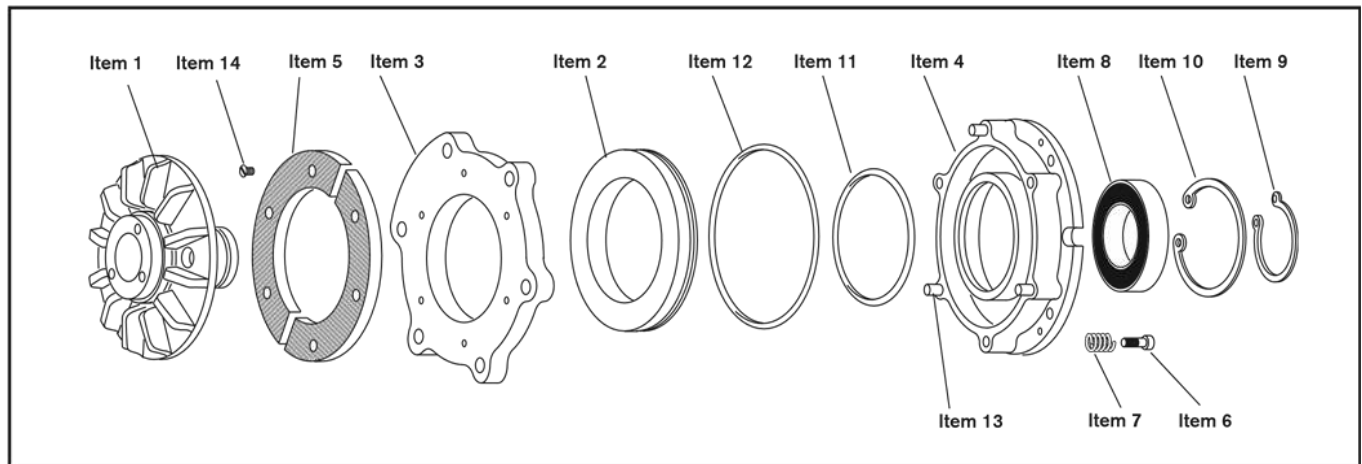


PARTS REPLACEMENT FRICTION FACINGS

1. Align the holes in the Friction Disc Hub (Item 1) with the Machine Screws (item 14) holding the split Friction Facing (Item 5)
2. Remove the old Machine Screws (Item 14)
3. Remove the old split Friction Facings (Item 5)
4. Install the new split Friction Facings (Item 5)
5. Secure the new split Friction Facings (Item 5) using the new Machines Screws with locking patch (Item 14)
6. Tighten the new Machine Screws to the recommended torque of 19 in-lb [2.1Nm]



ANVIL BRAKE (SPRAG SIDE) DETAIL



ITEM	DESCRIPTION	QTY
1	Friction Disc Hub	1
2	Piston	1
3	Piston Plate	1
4	Air Chamber	1
5	Friction Facing	1
6	Shoulder Bolt	3
7	Compression Spring	3

ITEM	DESCRIPTION	QTY
8	Ball Bearing	1
9	Retaining Ring	1
10	Retaining Ring	1
11	O-ring Seal	1
12	O-ring Seal	1
13	Dowel Pin	3
14	Machine Screw	6

9000-006 NEW brake unit 820601 - model T-600
 9000-006R REBUILD assembly unit (when available)

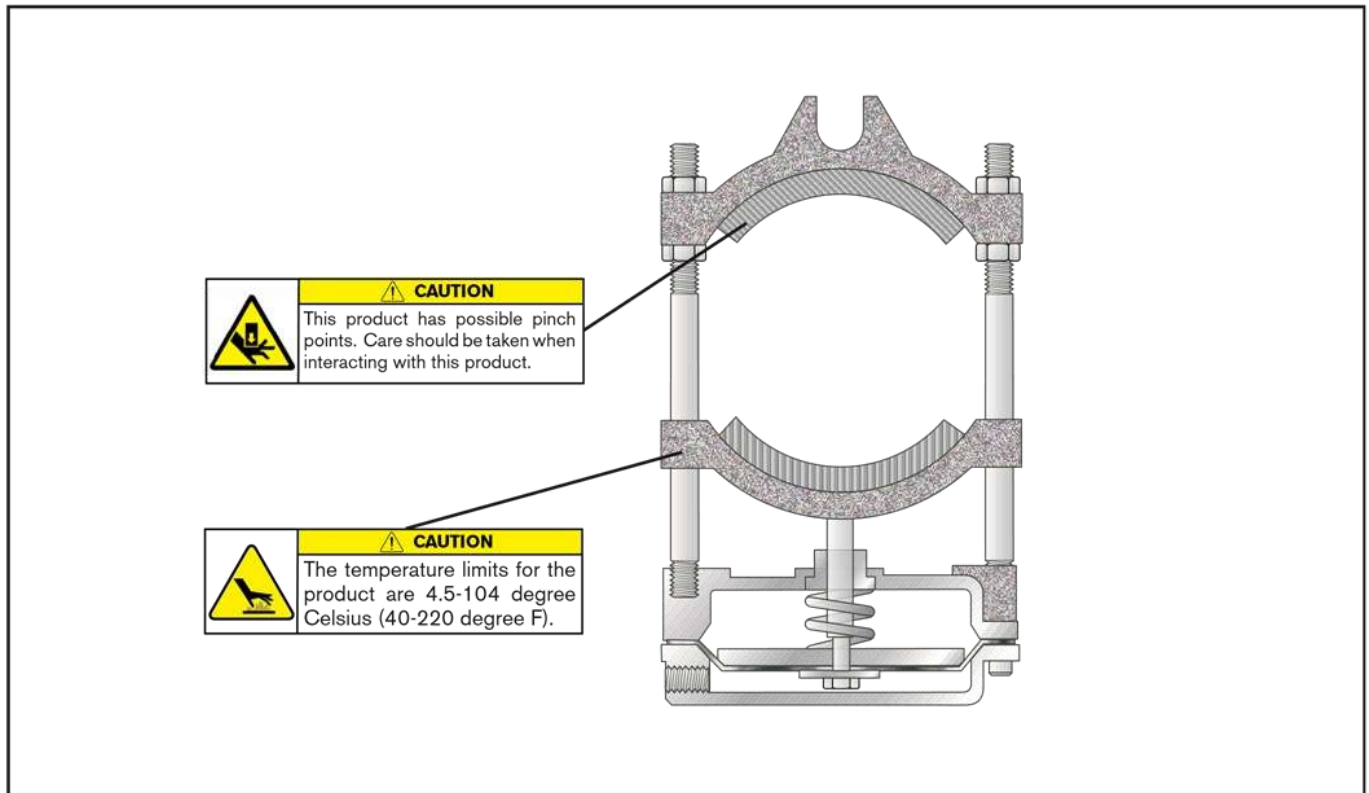
9000-008 Repair Kit 820510 - includes.....ITEM 6, 7, 8, 11, 12
 9000-009 Repair Kit 820572 - includes.....ITEM 5, 14

4500-066 QD Bushing replacement (NOT shown, mates with item 1)

NOTE:

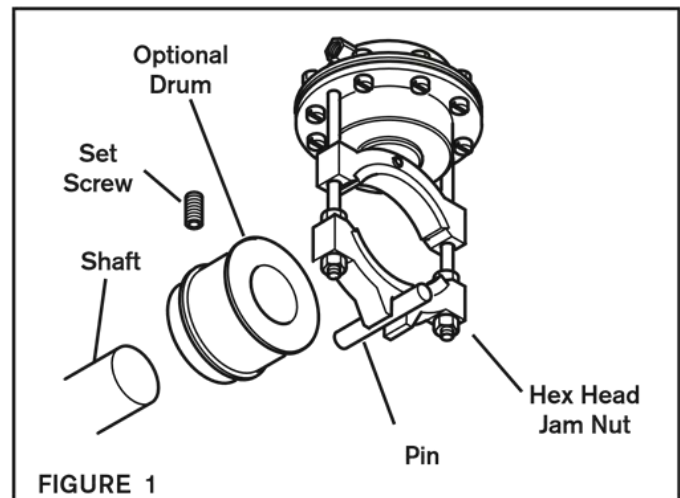
All other components
 can be special order
 per request

HAND WHEEL BRAKE DETAIL

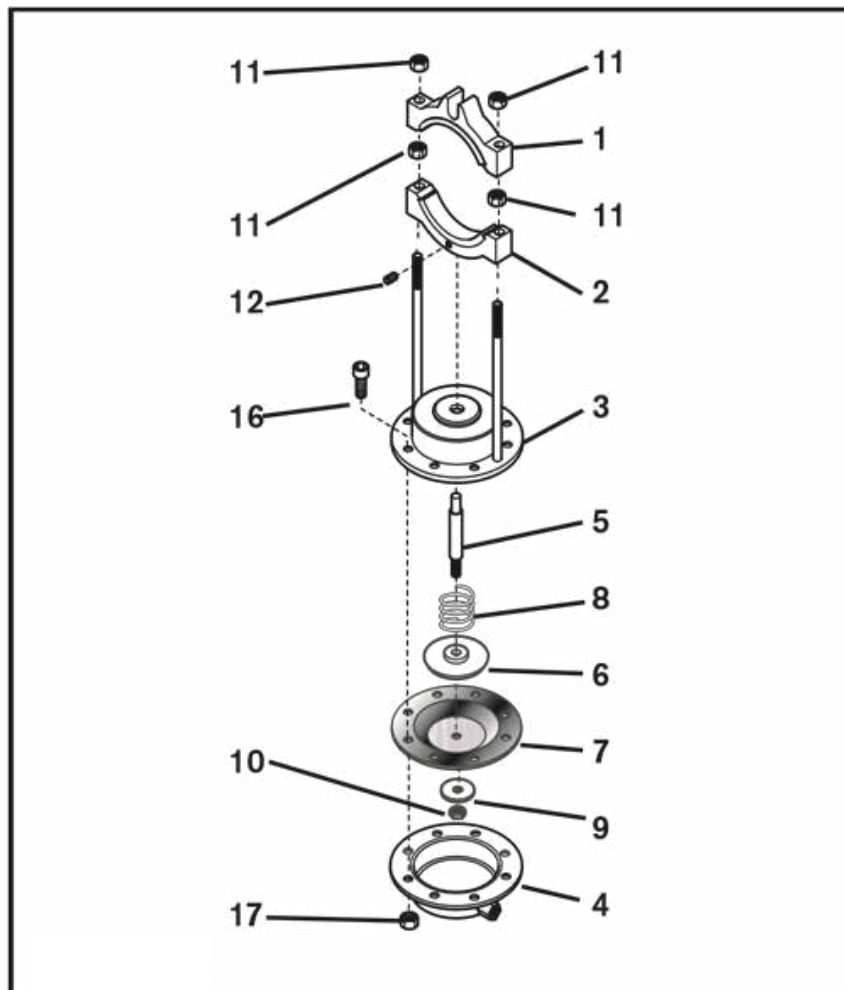


"J" DIAPHRAGM BRAKE WITH DRUM

1. Slide the Drum onto the shaft.
2. Tighten the set screw; securing the Drum to the shaft.
3. Position the "J" Diaphragm Brake on the Drum with the Pin passing through the slot in the Fixed Shoe.
4. Adjust the Fixed Shoe by loosening the Hex. Head Jam Nuts to provide sufficient clearance between the Facings and Optional Drum to allow free rotation of the Optional Drum; then, tighten the Hex Head Jam Nuts.



HAND WHEEL BRAKE DETAIL



NOTE:

Pressure setting should
be set at *20 psi*
or risk diaphragm rupture.

REPLACEMENT:

9000-030
Complete assembly unit

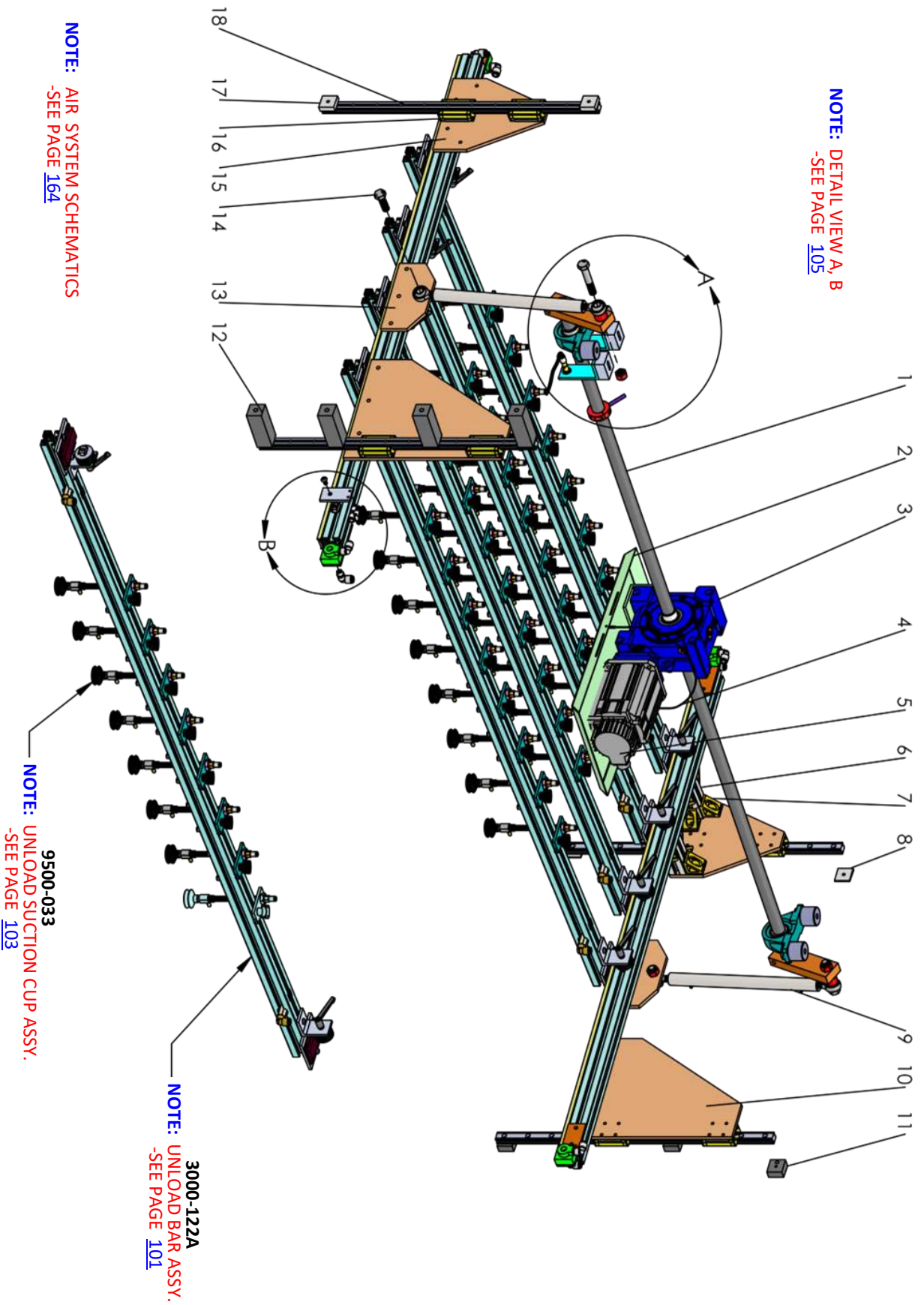
9000-030D
Diaphragm Replacement.....ITEM 7

ITEM	DESCRIPTION	QTY
1	Fixed Shoe Assembly	1
2	Sliding Shoe Assembly	1
3	Housing-Rod Assembly	1
4	Bottom Housing Assembly	1
5	Push Rod	1
6	Push Plate	1
7	Diaphragm	1
8	Compression Spring	1
9	Flat Washer	1
10	Hex Head Jam Nut	1
11	Hex Head Jam Nut	4
12	Set Screw	1
16	Socket Head Cap Screw	8
17	Hex Nut	8

Unload Side

UNLOAD FRAME DETAIL				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	3000-109	SHAFT - UNLOAD	SC-04	2
2	7000-293	PAN - DRIP, GEARBOX		1
3	7500-023	GEARBOX - ALPHA	BBTI# ALPHA - VDH063-MF1-016-041-BD2	1
4	8600-071	LANYARD - 0.0469in EYE TO EYE X 24.0in LONG	MCS# 90312A334	1
5	7500-072	MOTOR - SERVO, SIGMA V	BBTI# YASKAWA - SGMGV-20D3A6C	1
6	2000-161	STAND OFF - TRACK BAR, OPERATOR SIDE	80/20# 45-4545 X 100.93mm	2
7	7000-227	BRACKET - CORNER GUSSET	80/20# 40-4332	8
8	2000-105	STANDOFF - THK RAIL 5 DEGREE, OPERATOR SIDE		2
9	2500-081	ROD - CONNECTING	SC-09	2
10	7000-402	PLATE - BEARING, MAIN	SC16	2
11	2000-112	STANDOFF - THK RAIL 5 DEGREE, OPERATOR SIDE		4
12	2000-113	STANDOFF - THK RAIL 5 DEGREE, SPRAG SIDE		4
13	7000-317	PLATE - FRAME SUPPORT		2
14	M16-50-HH	SCREW - M16 X 2.0P X 50mm HHC	MCS# 91280A844	2
15	7000-403	PLATE - BEARING, GUIDE	SF6-A	2
16	4500-047	BEARING - SSR25 LINEAR	THK# SSR25XW1SS(GK)	8
17	10085	STAND OFF - THK RAIL 5 DEGREE, SPRAG SIDE		2
18	3000-072	RAIL - SR25 X 700mm	THK# SR25 X 700 RAIL	4

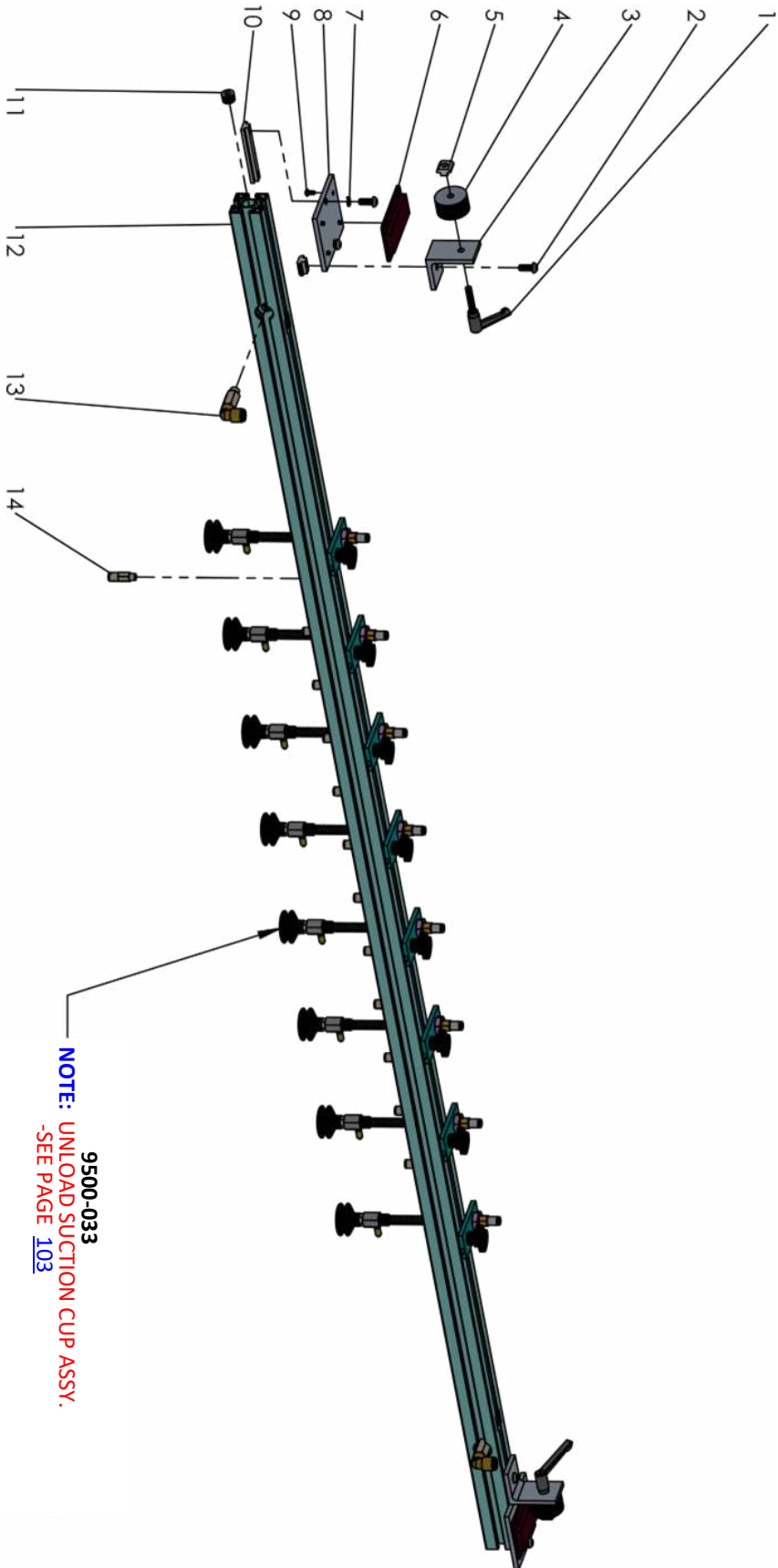
UNLOAD FRAME DETAIL



UNLOAD BAR ASSEMBLY #3000-122A				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	4000-054	HANDLE - M8 X 1.25P X 40mm, ADJUSTABLE	MCS# 6324K38	2
* 2	M8-16-BH	SCREW - M8 X 1.25P X 16mm BHCS	MCS# 91239A418	6
3	7000-234	BRACKET - LOCKING, UNLOAD BAR		2
4	2000-044	SPACER - LOCKING, BAR STOP	BLACK DELRIN 1.75in DIA; SF3-A	2
5	1500-042	NUT - M8 X 1.25P SLIDE IN T-NUT	80/20# 45-13049	4
6	4500-156	BEARING - SLIDE RAIL	THK# FBW3590XRUU	2
7	M8-SPL	WASHER - M8 SPLIT LOCK	MCS# 91202A230	6
8	7000-235	PLATE - BEARING MOUNT	SC17	2
9	M5-10-BH	SCREW - M5 X 0.8P X 10mm BHCS	MCS# 92095A208	8
10	1500-048	NUT - M8 X 1.25P SLIDE IN DOUBLE T-NUT, 90mm		2
11	3500-048	PLUG - 3/8 NPT HEX SOCKET	MCS# 1162T39	2
12	3000-122	BAR - UNLOAD	SF9-A	1
13	3500-511	ELBOW - 10mm X 1/4 RPT, EXTENDED CONNECTOR	SMC# KQ2W10-02S	2
14	3500-300	STRAIGHT - 6mm X 1/8 RPT, SELF SEAL	SMC# KCH06-01S	12

* OPT	M8-20-BH	SCREW - M8 X 1.25P X 20mm BHCS	MCS# 91239A426	10
	M8-SPL	WASHER - M8 SPLIT LOCK	MCS# 91202A230	10

UNLOAD BAR ASSEMBLY

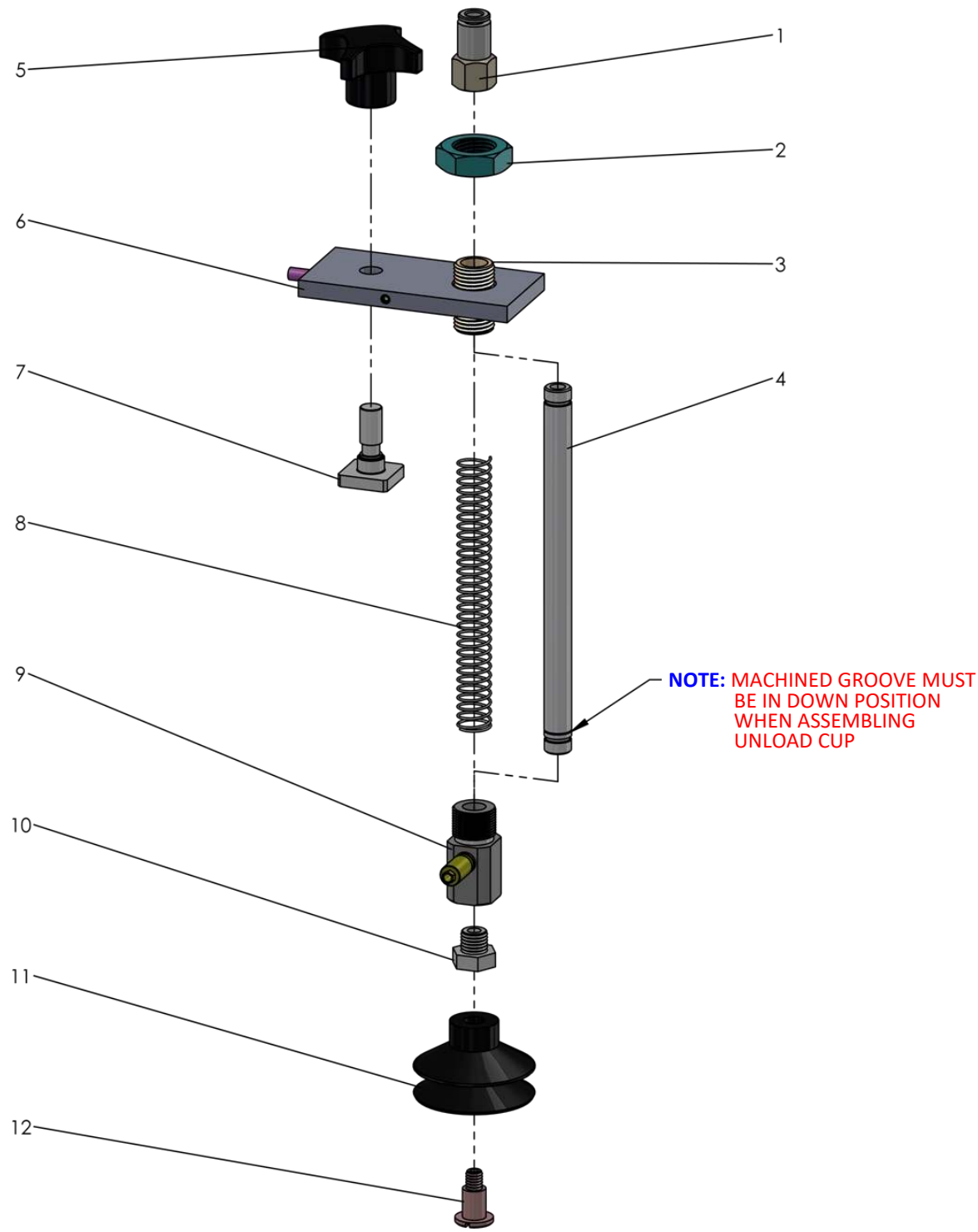


NOTE: AIR SYSTEM SCHEMATICS
-SEE PAGE [164](#)

NOTE: 9500-033
UNLOAD SUCTION CUP ASSY.
-SEE PAGE [103](#)

UNLOAD SUCTION CUP ASSEMBLY #9500-033				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	3500-325	STRAIGHT - 6mm X 1/8 RPT, FEMALE	SMC# KQ2F06-01A	1
2	1500-040	NUT - M16 X 1.5P JAM	MCS# 90326A135	1
3	4500-147	BUSHING - M16 X 1.5P, THREADED BRONZE		1
4	6500-024	STEM - 10mm OD X 6mm ID		1
5	4000-047K	KNOB - M8 X 1.25P THREADED HOLE, FOUR ARM	MCS# 6390K23	1
6	7000-199A	ASSEMBLY - UNLOAD PLATE		1
7	4000-047	STUD - SPECIAL TEE BOLT		1
8	7600-025	SPRING - COMPRESSION	FVSC# 0024420	1
9	4900-036	GENERATOR - VACUUM	AS# ER10-18F	1
10	3500-033	ADAPTER - VACUUM	E.L. SIMETH# HS6-18M-G	1
11	4900-032	CUP - VSA-43	COVAL# VSA-43NBR	1
12	3500-025	SCREW - HS6 FIXING	E.L. SIMETH# HS6	1

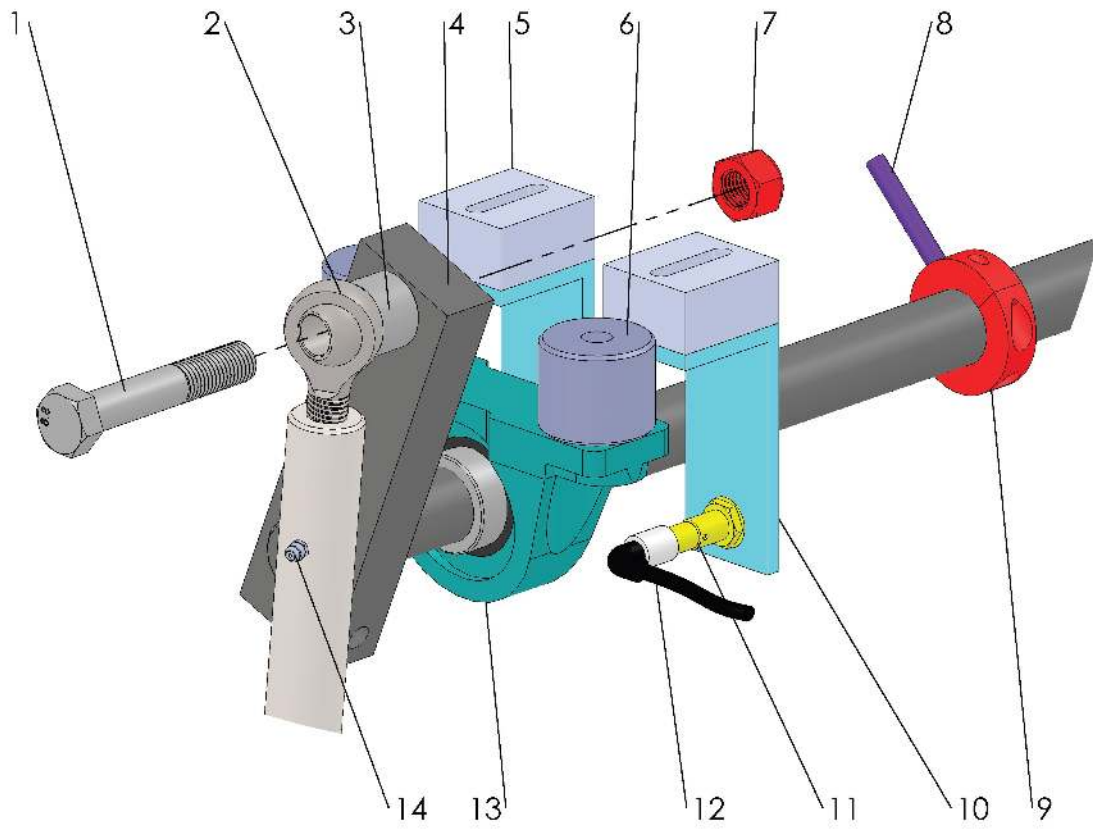
UNLOAD SUCTION CUP ASSEMBLY



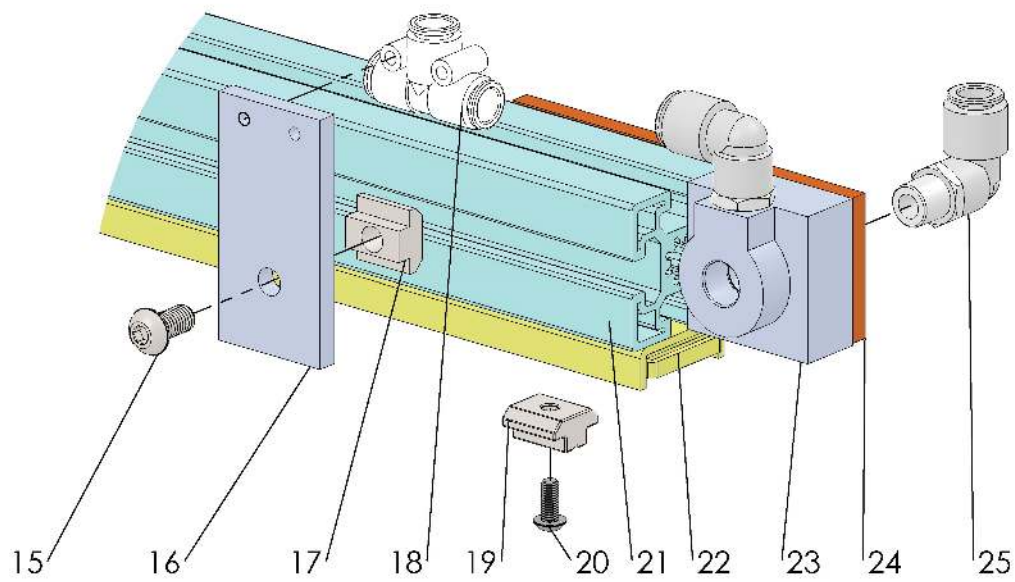
UNLOAD FRAME DETAIL				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	M16-90-HH	SCREW - M16 X 2.0P X 90mm HHC	MCS# 91280A852	2
2	4500-161	JOINT - 16mm X 2.0P MALE, ROD END	MCS# 59935K87; SC19	4
3	2000-106	SPACER - UPPER BALL JOINT	SC-10	2
4	7000-216	BRACKET - SWING ARM	SC-07	2
5	2000-092	SPACER - BRACKET, PROXIMITY	SF7A	2
6	2000-108	STANDOFF - 45mm OD X 36.68mm LONG	SC05	4
7	M16 NYL	NUT - M16 X 2.0P NYLOC	MCS# 90576A122	4
8	2500-060	ROD - POSITION		1
9	4500-215	CLAMP - LOCK COLLAR	SW4-A	1
10	7000-369	BRACKET - PROXIMITY MOUNT	SF7-B4	2
11	8501-047	SENSOR - INDUCTIVE PROXIMITY	BBTI# SENSOPART - 996-51449-IS 512-48-S	2
12	8600-000	CABLE - 4 PIN PROXIMITY SENSOR	BBTI# PHOENIX - 1406248	2
13	4500-160	BEARING - 30mm ID, PILLOW BLOCK	PTI# P2BSC30M	2
14	3500-038	STRAIGHT - M6 X 1.0P, GREASE FITTING	MCS# 1105K71	4
* 15	M8-16-BH	SCREW - M8 X 1.25P X 16mm BHCS	MCS# 91239A418	10
16	7000-297	PLATE - AIR FITTING	SF12-A	10
17	1500-042	NUT - M8 X 1.25P SLIDE IN T-NUT	80/20# 45-13049	10
18	3500-509	TEE - 10mm X 10mm, UNION	SMC# KQ2T10-00	10
19	1500-074	NUT - M5 X 0.8P SLIDE IN T-NUT	80/20# 45-13047	16
20	M5-12-BH	SCREW - M5 X 0.8 X 12mm BHCS	MCS# 92095A210	16
21	3000-088	BAR - TRACK, RAIL	80/20# 45-4545 X 1500mm; SF12-B	2
+ 22	3000-069	RAIL - FBW 3590 X 1500mm	THK# FBW 3590R X 1500 RAIL	2
23	7600-016	VALVE - QUICK RELEASE	SMC# NAQ2000-02	4
24	7000-324	PLATE - QUICK RELEASE FLAT MOUNT	SF2-A	3
25	3500-504	ELBOW - 10mm X 1/4 RPT	SMC# KQ2L10-02S	8

* OPT	M8-20-BH	SCREW - M8 X 1.25P X 20mm BHCS	MCS# 91239A426	10
	M8-SPL	WASHER - M8 SPLIT LOCK	MCS# 91202A230	10
+	7000-486	BRACKET - QUICK RELEASE ANGLE MOUNT (NOT SHOWN - REQ'D ONLY ON ONE CORNER)	SF1-A	1

UNLOAD FRAME VIEWS



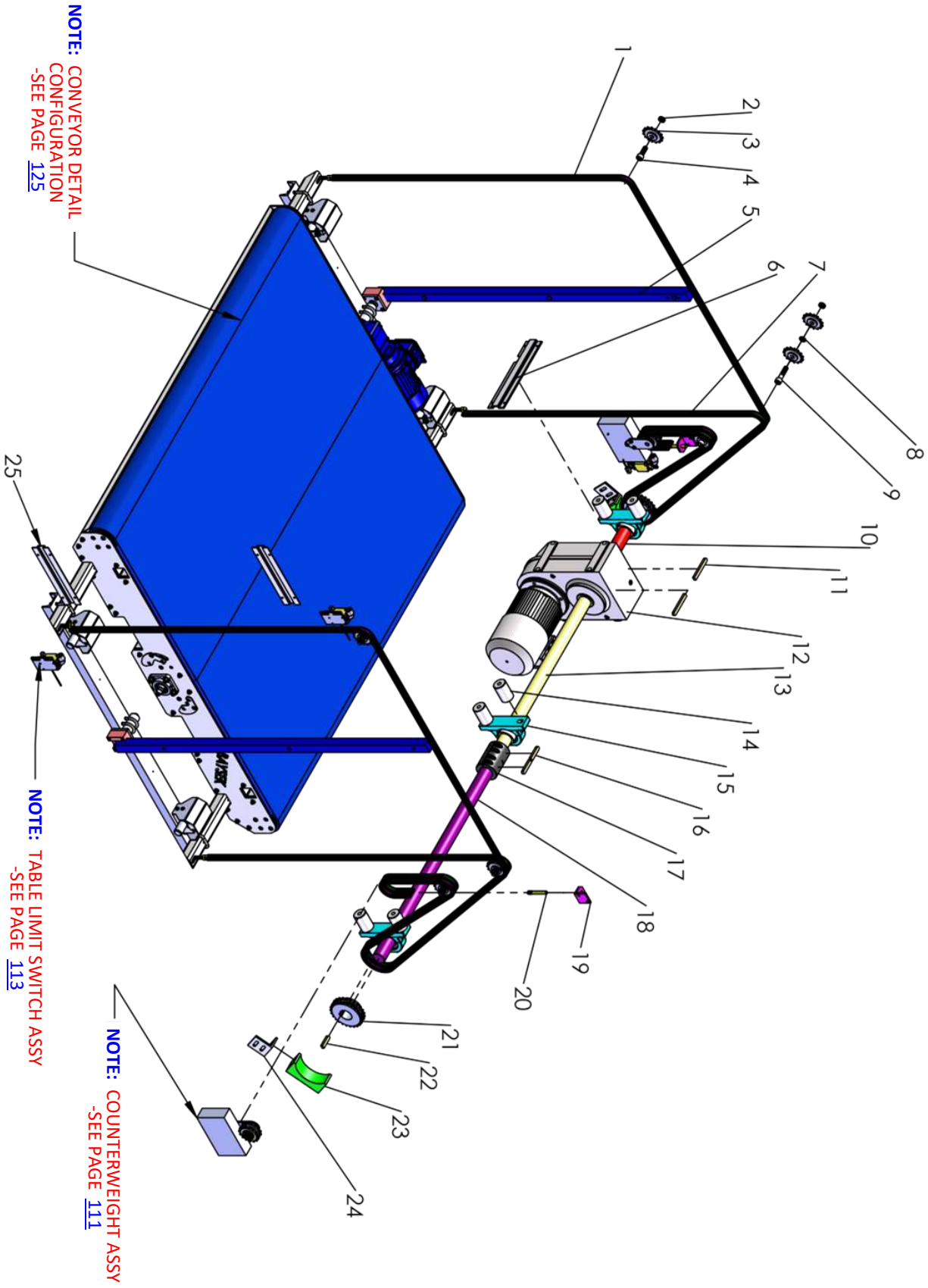
DETAIL A



DETAIL B

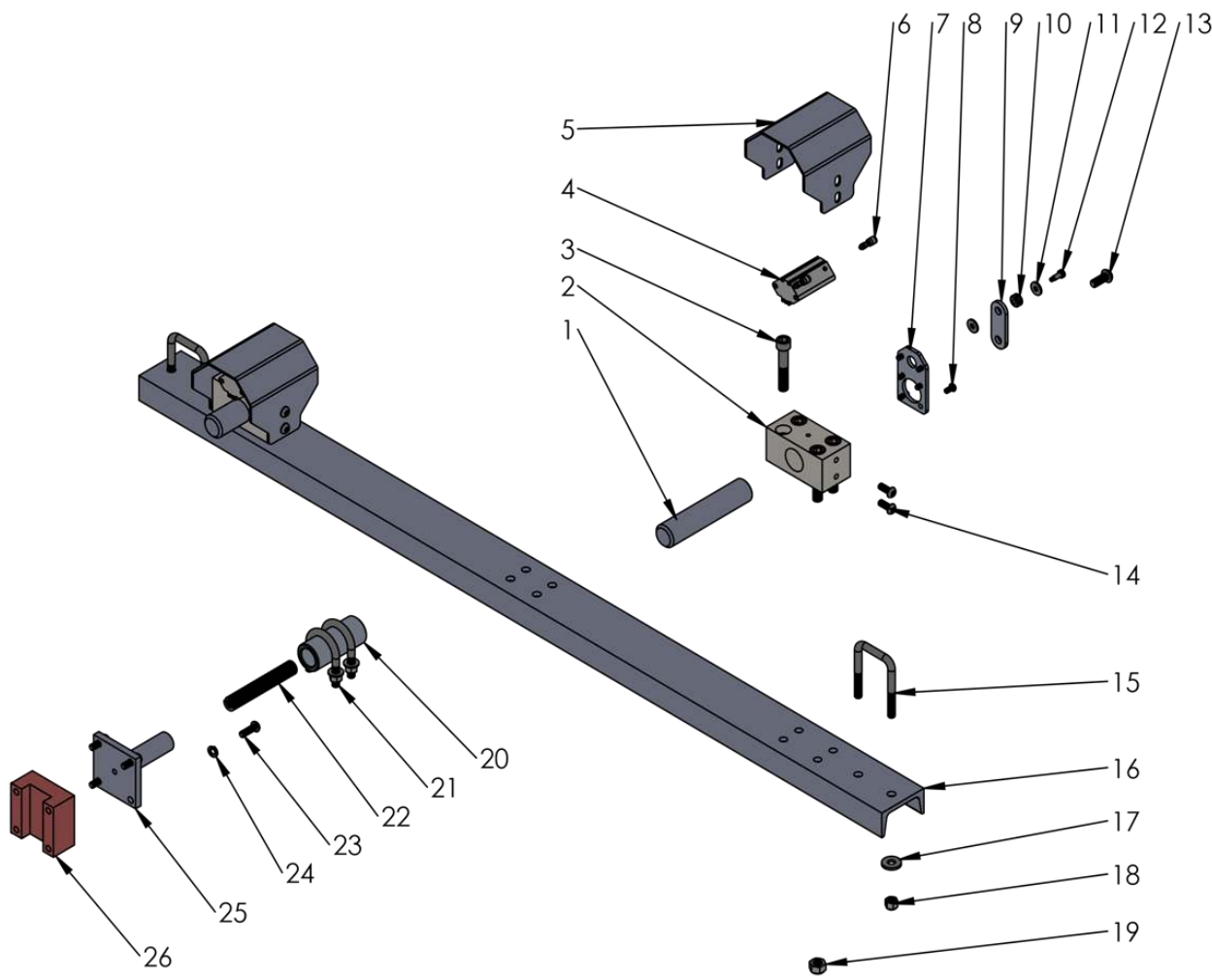
UNLOAD LIFT TABLE DETAIL				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	5000-064	CHAIN - LIFT 1, LIFT 3	50 RIV ROLLER CHAIN X 203in	2
2	7000-945	SPACER - WALL TO SPROCKET		6
3	4500-300	SPROCKET - IDLER ROLLER CHAIN	BDI# 621213 - M/G 50BB15H	10
4	M16-45-SH	SCREW - M16 X 2.0P X 45mm SHCS	MCS# 91290A815	2
5	2000-088	BAR - VERTICAL GUIDE	LT-19	2
6	8600-076	COVER - WIRE, BULK HEAD	80/20# 25-8611-4M (CUT TO LENGTH, PER PRINT)	1
7	5000-062	CHAIN - LIFT 2, LIFT 4	50 RIV ROLLER CHAIN X 164in	2
8	7000-944	SPACER - DOUBLE SPROCKET		4
9	M16-65-SH	SCREW - M16 X 2.0P X 65MM SHCS	MCS# 91290A835	4
10	3000-104	SHAFT - LIFT 1	LT-06	1
11	2500-064	KEY - 9mm X 14mm X 108mm		2
12	7500-029	MOTOR - LIFT TABLE	SEW# FA77BDRE90L4BE2HR	1
13	3000-105	SHAFT - LIFT 2	LT-07	1
14	2000-079	STANDOFF - 50mm OD X 77.8mm LONG	LT09	6
15	4500-159	BEARING - 50mm ID, PILLOW BLOCK	PTI# UCP210 SOLID BASE PIL BLK	3
16	2500-063	KEY - 9mm X 14mm X 67mm		2
17	4500-216	COUPLING - 50mm ID	WBT# 2MISCC-50-50-KW	1
18	3000-106	SHAFT - LIFT 3	LT-08	1
19	7000-274	BRACKET - COUNTERWEIGHT MOUNT	MP7-A	2
20	1000-452	BOLT - M12 X1.75P X 90mm, CONNECTING, DBL	LT02-B	2
21	4500-211	SPROCKET - DRIVE	EGI# DS50B25 PER DWG LT05	2
22	2500-065	KEY - 9mm X 14mm X 57mm		2
23	5000-052	BLOCK - CHAIN KEEPER, OP SIDE	L	2
24	7000-356	BRACKET - CHAIN KEEPER	MP3-A	2
25	8600-068	COVER - LASER WIRE		2

UNLOAD LIFT TABLE DETAIL



PNEUMATIC TABLE PINS DETAIL #9500-113				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	3000-164	PIN - PUSH, TABLE PIN		2
2	7000-278	BLOCK - LOCKOUT PIN		2
3	M12-65-SH	SCREW - M12 X 1.75P X 65mm SHCS	MCS# 91290A632	8
4	10320	CYLINDER - DB ACTING, 3/4" BORE	SMC #CDQ2A20-50DZ	2
5	10171	GUARD - PNEUMATIC TABLE PIN		2
6	3500-214	ELBOW - 4mm X M5 X 0.8P	SMC# KQ2L04-M5A	4
7	3000-166	PLATE - CYLINDER ADAPTER		2
8	M6-25-BH	SCREW - M6 X 1.0P X 25mm BHCS	MCS# 91239A318	12
9	3000-165	BAR - CYLINDER PIN		2
10	4200-041	GROMMET - 0.25in ID X 0.625in OD X 0.313in THICK	MCS# 9307K38	2
11	M6-FEN	WASHER - M6	MCS# 93475A250	4
12	4200-043	SCREW - M5 X 0.8P X 6mm X 12mm SHOULDER	MCS# 94361A523	2
13	M10-25-BH	SCREW - M10 X 1.5P X 20mm BHCS	MCS# 91239A513	2
14	M8-20-BH	SCREW - M8 X 1.25P X 20mm BHCS	MCS# 19239A426	8
15	1000-521	BOLT - 3/8in X 2.0in X 4.625in, SQUARE U	MCS# 3060T450	2
16	3000-167	CHANNEL - BAR, PNEUMATIC		1
17	2000-063	WASHER - 3/8in OVERSIZE	MCS# 98029A046	4
18	1500-068	NUT - 3/8-16 NYLOC	MCS# 95615A140	4
19	M12-NYL	NUT - M12 X 1.75P NYLOC	MCS# 94645A230	8
20	3000-169	SHAFT - SPRING GUIDE		1
21	4200-044	BOLT - 5/16in X 1.5in X 2.1875in, U	MCS# 3043T623	2
22	4200-045	SPRING - 0.75OD X 5.0L	MCS# 9657K213	1
23	M8-25-BH	SCREW - M8 X 1.25P X 25mm BHCS	MCS# 91239A427	4
24	M8-SPL	WASHER - M8 SPLIT LOCK	MCS# 91202A230	4
25	3000-170	PLUNGER - SPRING GUIDE		1
26	7000-090C	BLOCK - GUIDE	LT-17	1

PNEUMATIC TABLE PIN DETAIL



COUNTERWEIGHT DETAIL				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	M8-20-BH	SCREW - M8 X 1.25P X 20mm BHCS	MCS# 19239A426	4
2	M8-SPL	WASHER - M8 SPLIT LOCK	MCS# 91202A230	4
3	7000-940	WELDMENT - CHAIN WEIGHT SIDE PLATE		1
4	7000-943	BLOCK - COUNTERWEIGHT		1
5	4500-301	SPROCKET - IDLER, LIGHTWEIGHT	MCS# 8255K12	2
6	7000-946	SPACER - SPROCKET, LIGHTWEIGHT IDLER		1
7	2000-032	WASHER - M8 OVERSIZE	MCS# 91100A160	1

COUNTERWEIGHT DETAIL

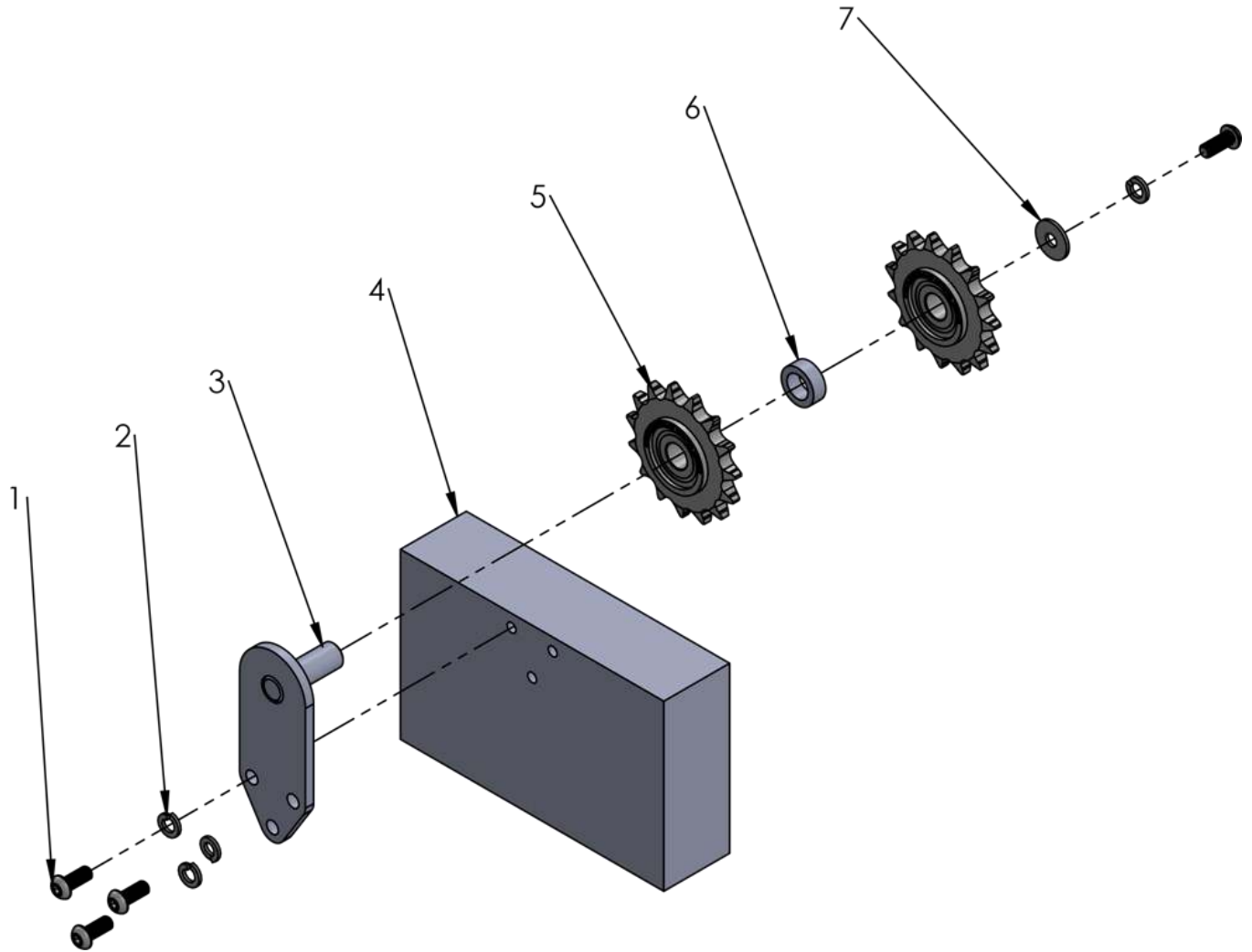
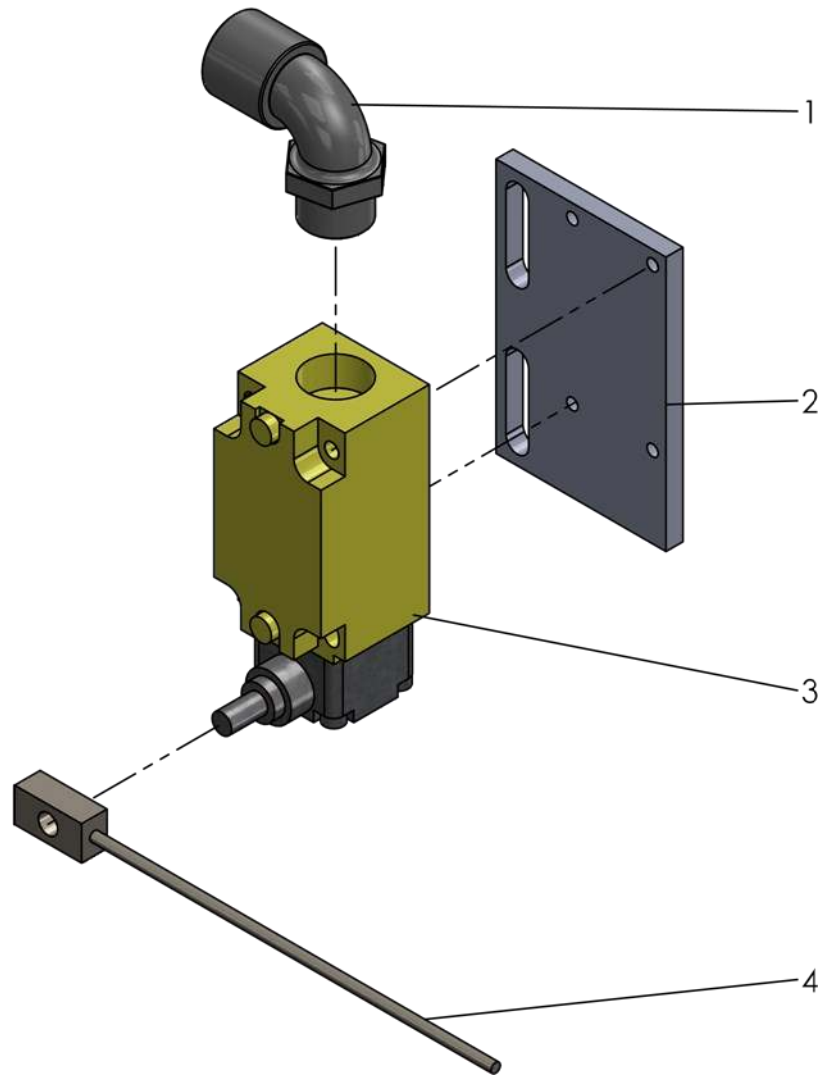


TABLE LIMIT SWITCH DETAIL #9500-070				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
* 1	8600-069	ELBOW - 0.25-0.38in X 1/2 KO, CABLE GRIP	MCS# 7466K411	1
2	7000-357	PLATE - LIMIT SWITCH MOUNT	LT6-A	1
3	8501-052	SWITCH - LIMIT	BC# OMRON - D4B-4111N-NPT	1
4	8501-095	LEVER - WIRE LIMIT TRIP, STG	BC# OMRON - D4A-D00	1

* OPT	8600-063	STRAIGHT - CABLE GRIP (NOT SHOWN)	GE# 88148289	1
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TABLE LIMIT SWITCH DETAIL



SINGLE FACE - UNLOAD BLOWER ASSEMBLY #9500-085 (OPTIONAL)				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	7500-054	BLOWER - FAN HRC600	REPUBLIC# HRB600	2
2	7000-495	FRAME - UNLOAD, SF		1
3	6500-069	WELDMENT - BLOWER EXHAUST, SF		2
4	7000-493	CLAMP - 2.50" DIA. TUBE, SF	MCS# 4322K154	2
5	4900-052	SEAL - 2.50 TUBE OD, SF	MCS# 4509K16	2
6	3500-082	MANIFOLD - UNLOAD, SF		2
7	3500-087	PLUG - MALE COUPLING, SF	MCS# 5535K68	1
8	7000-496	BRACKET - UNLOAD TUBE MOUNT, SF		2
9	7600-021	VALVE - SY7120-5DZ C10-Q SOLENOID	SMC# SY7120-5DZC10-Q	1
10	8501-126	BREAKER - CIRCUIT SM1RE1000	BBTI# LOVATO - SM1RE 1000	1
11	8501-123	CONTACTOR - BLOWER MOTOR	BBTI# LOVATO - BF1201D024 3P	1
12	8506-004	BASE - POWER BUS	BBTI# LOVATO - SM1X3142R	1
13	8506-005	BASE - ADAPTER FOR CONTACTOR, BREAKER	BBTI# LOVATO - 11SMX9010	1

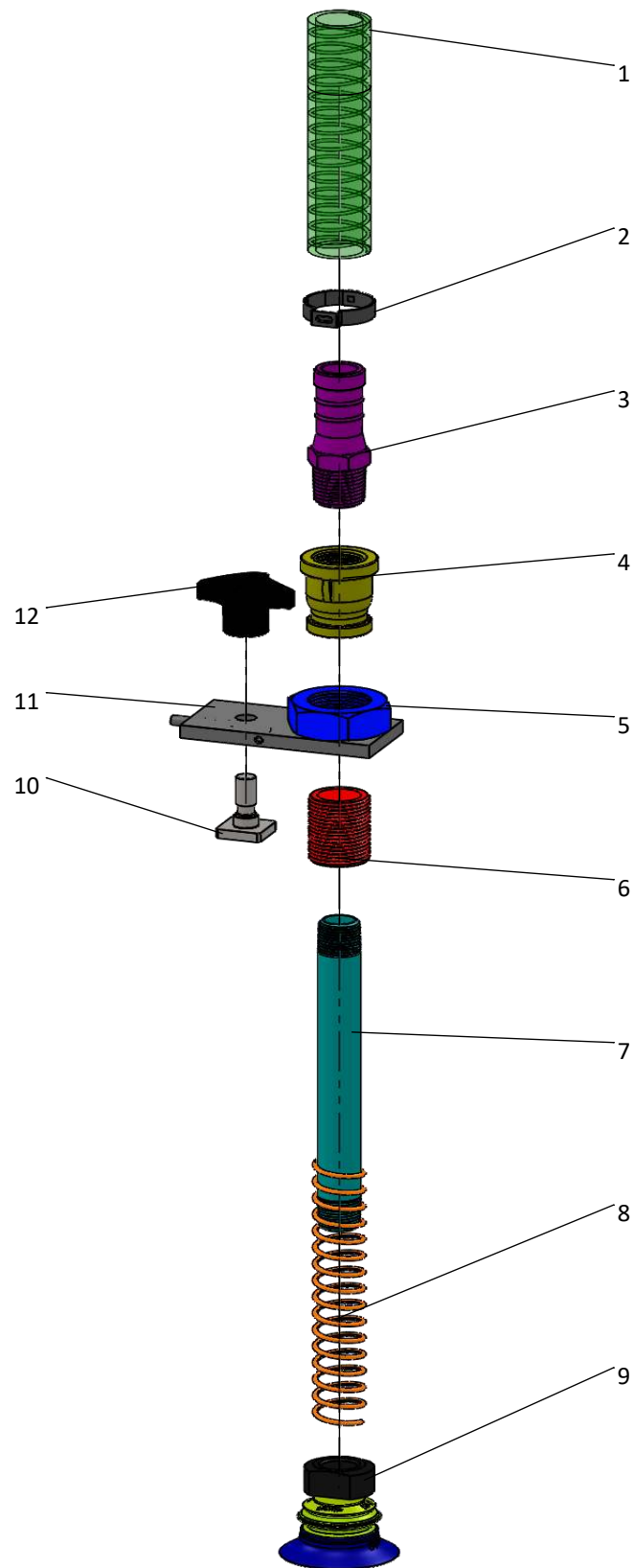
#9500-085**NOTE: SINGLE FACE OPTION KIT INCLUDES:**

- (1) SINGLE FACE - LOAD BLOWER ASSEMBLY (See page [43](#))
- (1) SINGLE FACE - UNLOAD BLOWER ASSEMBLY (This page)



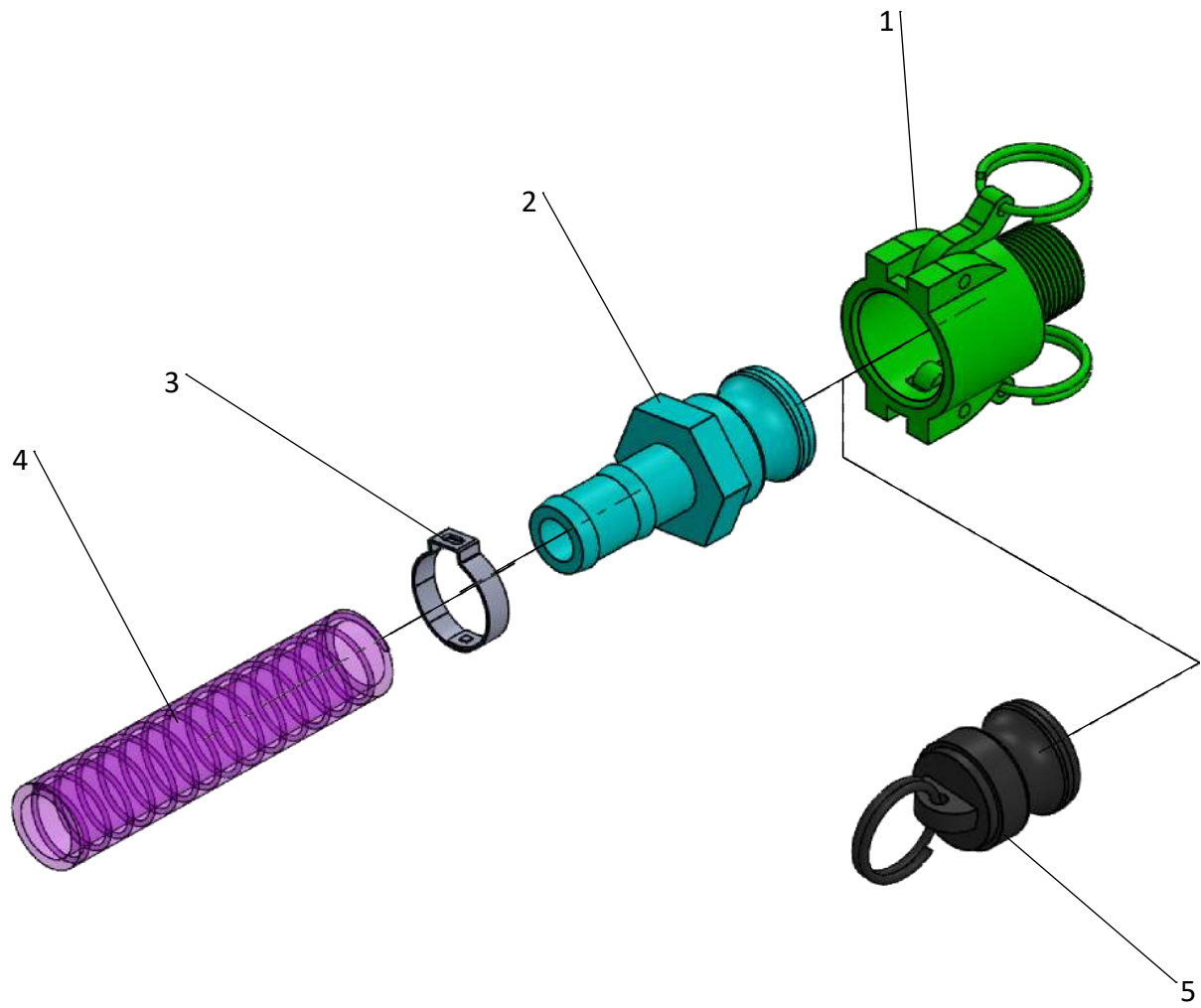
SINGLE FACE - UNLOAD CUP ASSEMBLY #9500-033SF (OPTIONAL)				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	6500-065	TUBING - 0.75in ID CLEAR, SF	MCS# 5136K17	1
2	7000-487	CLAMP - 0.89 - 1.06 PINCH, SF	MCS# 54285K38	1
3	3500-078	FITTING - UNLOAD CUP M, SF	MCS# 5350K44	1
4	3500-079	FITTING - UNLOAD CUP F, SF	MCS# 4464K525	1
5	1500-082	NUT - 1in X 14P JAM	MCS# 91078A255	1
6	4500-239	BUSHING - UNLOAD, BRONZE, SF		
7	6500-068	STEM - 3/8 NPT, 6" LONG, STAINLESS STEEL		1
8	7600-059	SPRING - LOAD/UNLOAD BRACKET	FVSC# FV0040835	1
9	4900-049	CUP - UNLOAD SINGLE FACE	PIAB# G.BG148S50.B1.S1.NT38F.00	1
10	4000-047	STUD - SPECIAL TEE BOLT		1
11	7000-199SFA	ASSEMBLY - UNLOAD PLATE (MODIFIED)		1
12	4000-047K	KNOB - M8 X 1.25P THREADED HOLE, FOUR ARM	MCS# 6390K23	1

SINGLE FACE - UNLOAD CUP ASSEMBLY (OPTIONAL)



SINGLE FACE - QUICK COUPLING DETAIL (OPTIONAL)				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	3500-085	FITTING - COUPLING, SF	MCS# 5535K56	1
2	3500-086	FITTING - HOSE BARBED END, SF	MCS# 5535K54	1
3	7000-487	CLAMP - 0.89 - 1.06 PINCH, SF	MCS# 54285K38	1
4	6500-065	TUBING - O.75in ID CLEAR, SF	MCS# 5136K17	1
5	3500-087	FITTING - HOSE PLUG, SF	MCS# 5535K68	

SINGLE FACE - QUICK COUPLING DETAIL (OPTIONAL)



SINGLE FACE - WYE VALVE DETAIL #9500-084 (OPTIONAL)				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	6500-070	PIPE - 2.0in NIPPLE	MCS# 44615K419	2
2	6500-071	PIPE - 2.0in WYE	MCS# 44605K359	1
3	6500-072	FITTING - FLANGE		1
4	7600-071	VALVE - SINGLE FACE RELEASE		1
5	1500-083	NUT - M10 X 1.5P JAM	MCS# 90695A041	2
6	7000-511	PLATE - VALVE SEAL, S.F.		1
7	7000-512	PLATE - CYLINDER MOUNT, S.F.		1
8	4200-016	CYLINDER - CHAIN TENSIONER, SPRAG	SMC# CD85N25-25-B	1
9	3500-306	ELBOW - 6mm X 1/8 RPT	SMC# KQ2L06-01AS	2

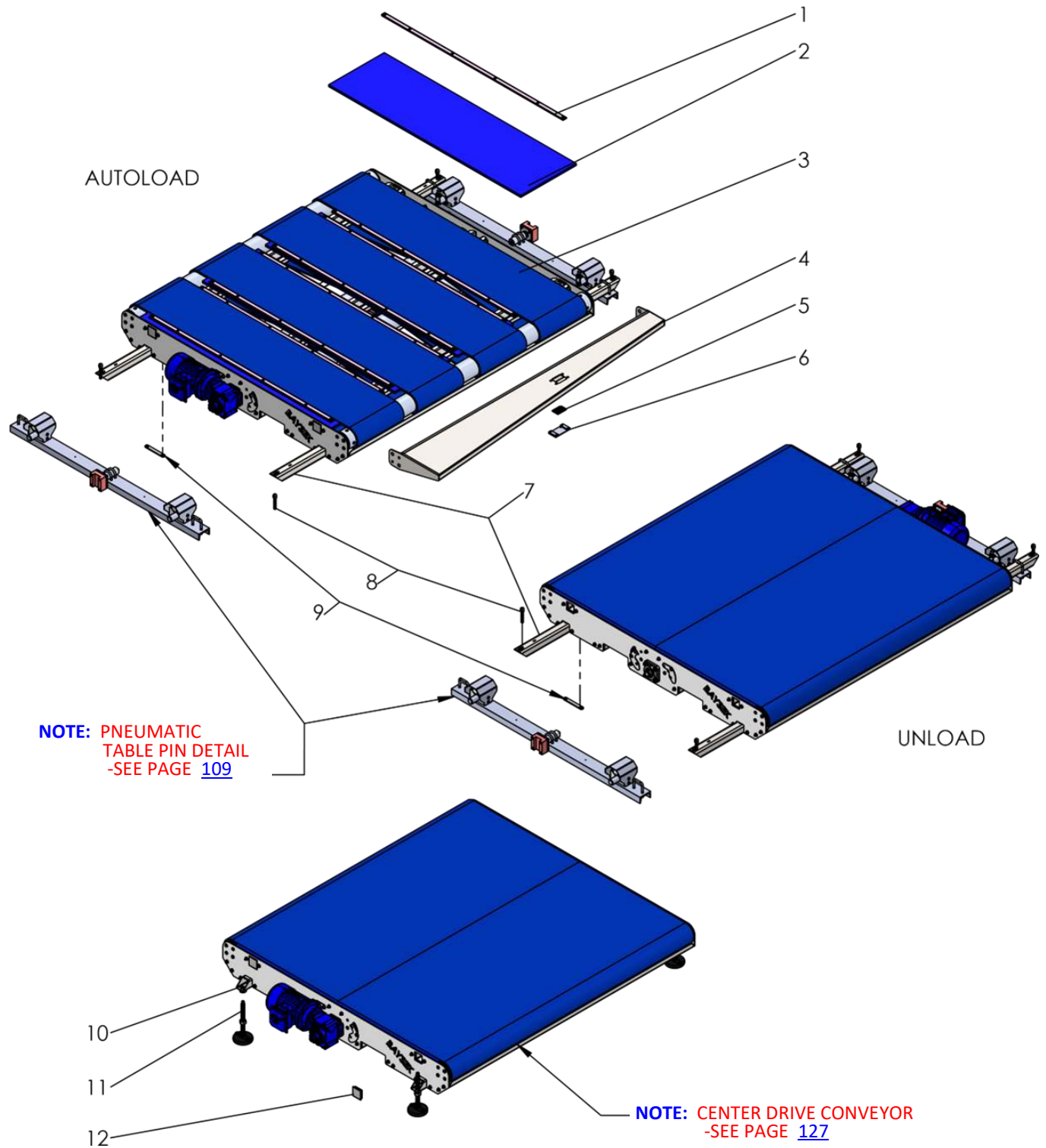
SINGLE FACE - WYE VALVE DETAIL (OPTIONAL)



Conveyor

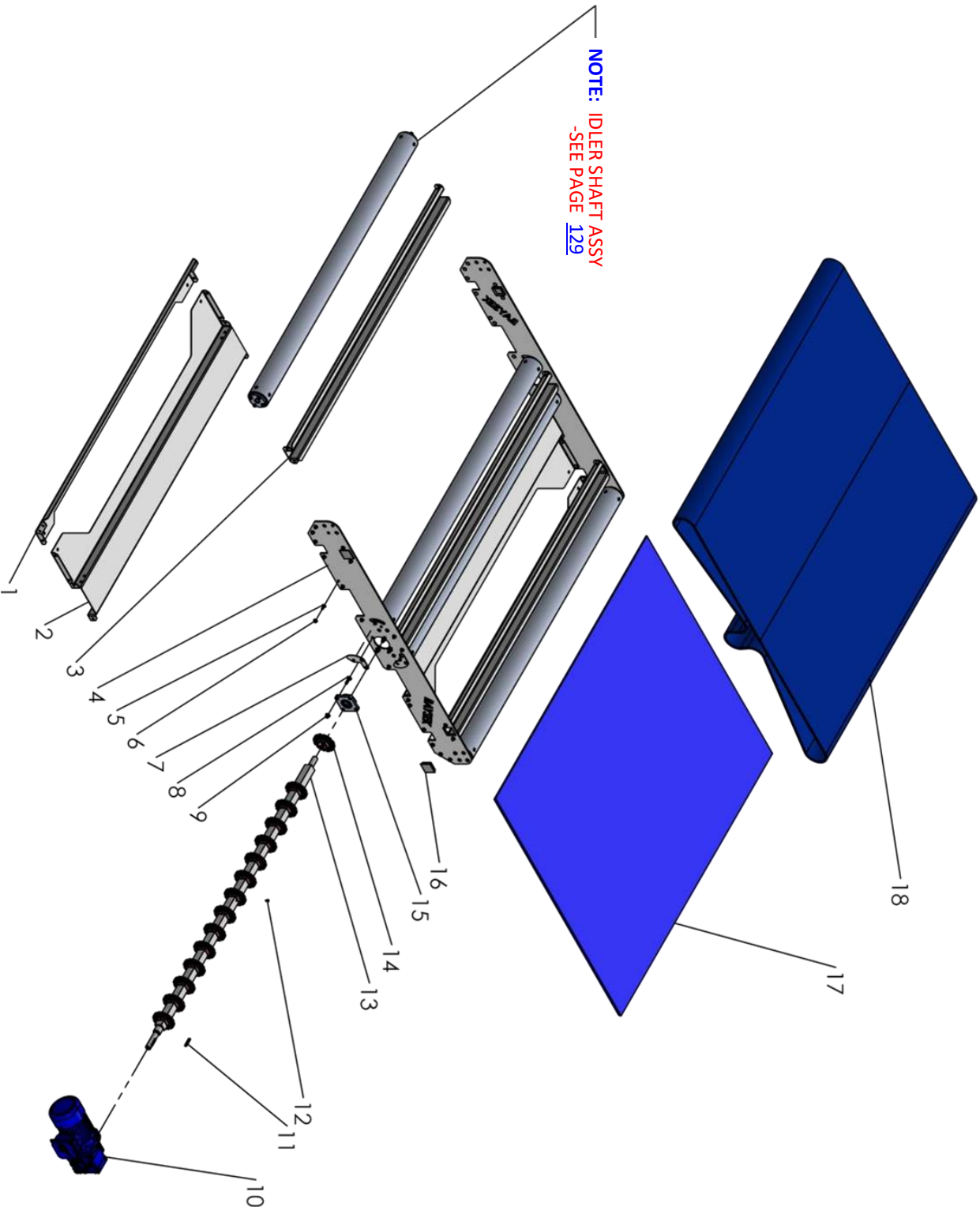
CONVEYOR CONFIGURATION DETAIL				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	10411	GUARD - AUTO LOAD CONVEYOR BELT EDGE		8
2	10530	PANEL - BED MATERIAL	15-7/8in X 54in	4
3	6000-008	BELT - 13in WIDE X 135 ROWS	INTRALOX#SERIES 900 FLAT TOP ACETAL BLUE	4
4	10149	PLATE - EXTENDED TABLE		1
5	8501-051	REFLECTOR - OMRON	BC# OMRON - E39-R1	1
6	10151	BRACKET - REFLECTOR MOUNT		1
7	3000-168	BAR - LIFT ARM		2
8	1000-448	BOLT - M12 X 90 CONNECTING		4
9	10206	PLATE - CROSSMEMBER RETAINER		4
10	10205	TUBE - LEG, CENTER DRIVE CONVEYOR		2
11	7000-822	FOOT - ADJUSTABLE	MCS# 2531K221	4
12	3500-653	PLUG - POLYETHYLENE SQUARE PLUG	MCS# 9565K91	4

CENTER DRIVE CONVEYOR CONFIGURATION



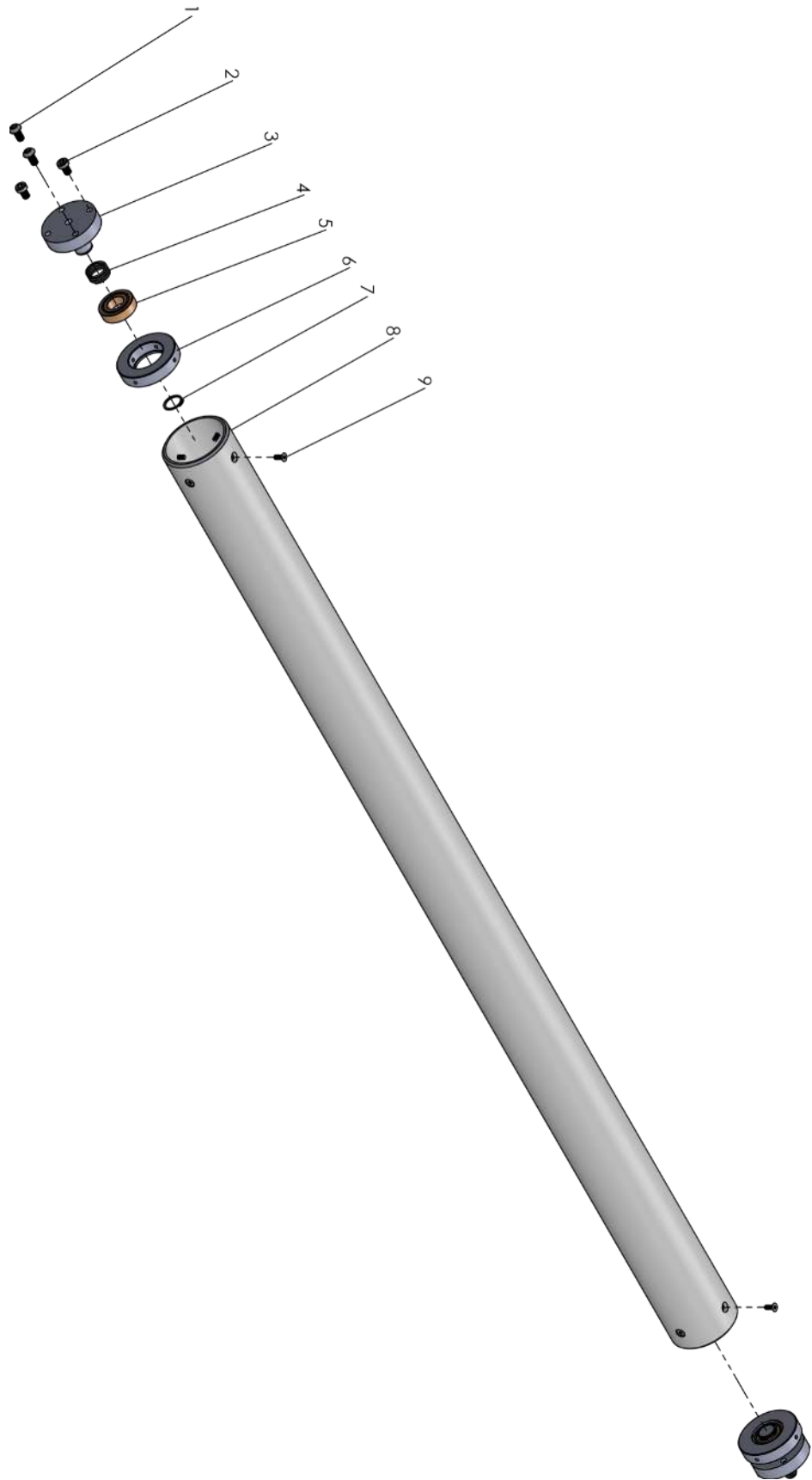
EXTERNAL / UNLOAD CONVEYOR DETAIL (OPTIONAL)				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	10201	PLATE - END		2
2	10202	CROSSMEMBER - LOWER		2
3	10203	CROSSMEMBER - UPPER		3
4	10200	PLATE - SIDE		2
5	10238	SCREW - M8 X 1.25P X 20 CARRIAGE	MCS# 98930A116	40
6	10169	NUT - M8 X 1.25P SERRATED FLANGE	MCS# 96194A102	40
7	10207	COVER - TENSIONER		4
8	10239	SCREW - M10 X 1.5P X 35 CARRIAGE	MCS# 98930A217	8
9	10208	NUT - M10 X 1.5P SERRATED FLANGE	MCS# 99908A103	8
10	7500-080	MOTOR - EXTERNAL CONVEYOR	NORD# WSK1S150FAIIIB-N56C-8	1
11	2500-071	KEY - 7mm X 8mm X 50mm		1
12	M6-10-SH	SCREW - M6 X 1.0P X 10 SHCS	MCS# 91290A316	2
13	10204	SHAFT - DRIVE		1
14	4500-171	SPROCKET - 12T ACETAL	INTRALOX - SERIES 900 SPROCKET - 4.1in (12T)	15
15	4500-083	BEARING, FLANGE, RCJ 25MM BORE	MCS# 4071N12	1
16	3500-653	PLUG - SQUARE, POLYETHYLENE	MCS# 9565K91	4
17	7000-932	BED MATERIAL - CENTER DRIVE CONVEYOR		1
18	6000-014	BELT - 67.9IN WIDE X 145 ROWS LONG	INTRALOX SERIES 900 FLUSH EDGE FLAT TOP	1

CENTER DRIVE CONVEYOR DETAIL (OPTIONAL)



CONVEYOR IDLER SHAFT				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	M10-20BH	SCREW - M10 X 1.5P X 20MM BHCS	MCS# 91239A513	4
2	1000-627	SCREW - M10 X 1.5P X 16MM SHCS (LOW PROFILE)	MCS# 93070A211	4
3	7000-934	SHAFT IDLER END		2
4	7600-075	SPRING - COMPRESSION	MCS# 9657K545	2
5	4500-284	BEARING - BALL 6205-2RS, 25MM	MCS# 5972K460	2
6	7000-935	SPACER - BEARING MOUNT		2
7	2500-124	RING -EXTERNAL RETAINING	MCS#98541A440	2
8	7000-933	ROLLER - IDLER TUBE		1
9	M6-16-FH	SCREW - M6 X 1.0P X 16mm FHCS	MCS# 91239A230	8

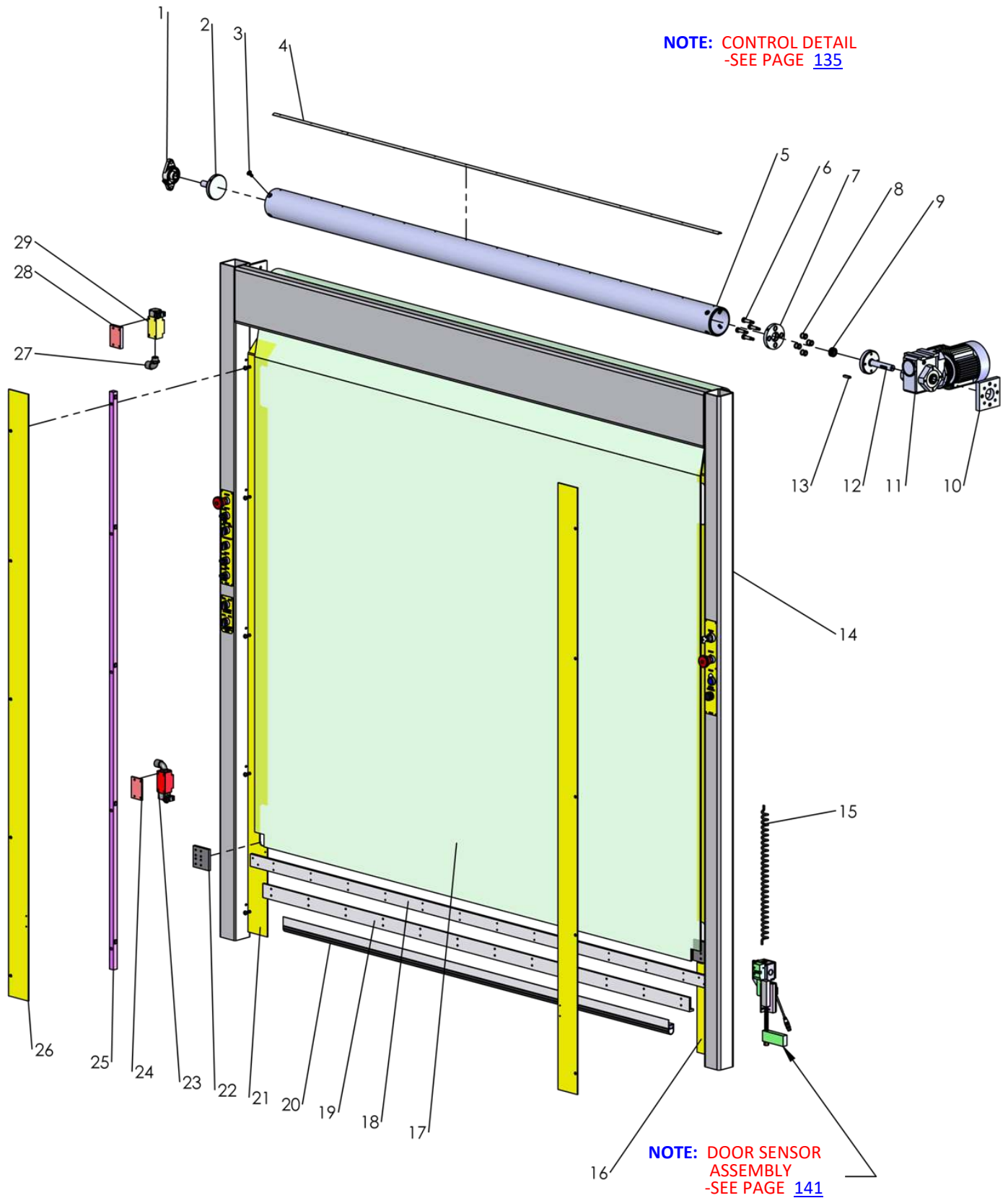
CONVEYOR IDLER SHAFT



Machine Frame

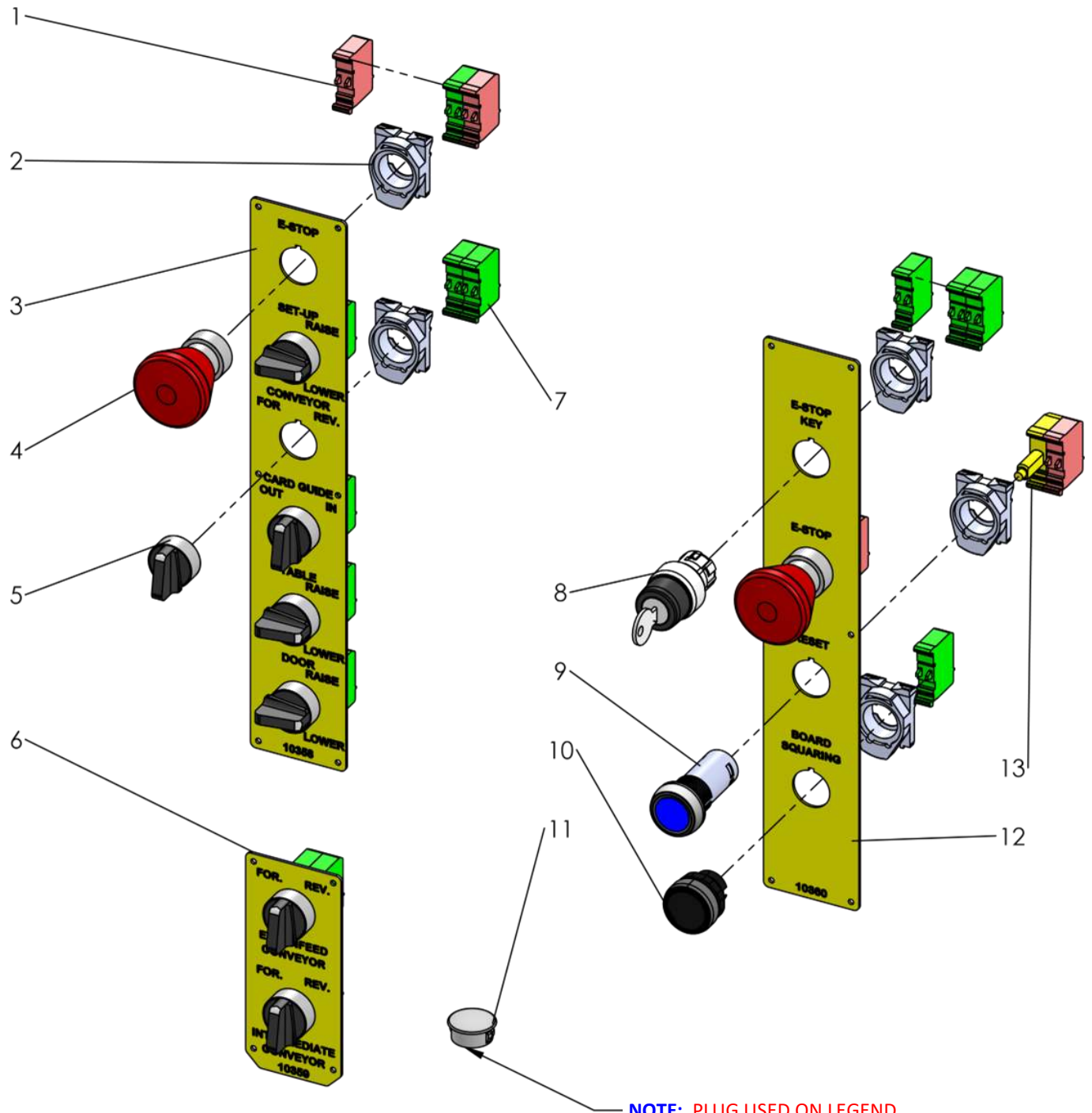
ROLL UP DOOR DETAIL - LOAD END				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	4500-167	BEARING - 20mm ID, FLANGE	PTI# UCFL204-20	1
2	7000-709	SHAFT - FLEX ROLLER, IDLER		1
3	M8-20-FH	SCREW - M8 X 1.25P X 20mm FHCS	MCS# 91294A284	8
4	7000-483	PLATE - VINYL MATERIAL CLAMP SET ...[ONE LONG, ONE SHORT]	MCS# 8124A43	1
5	7000-708	ROLLER - ROLL UP DOOR		1
6	1000-603	SCREW - 10MM X 30MM - M8 X 1.25P THREAD, SHOULDER	MCS# 92981A305	4
7	7000-707	PLATE - FLEX ROLLER, DRIVE		1
8	4500-278	BUSHING - RUBBER GROMMET, 9/16 X 1/2 X 3/8	MCS# 9600K88	4
9	4500-277	BEARING - SPHERICAL BALL JOINT, 12mm	MCS# 2995K14	1
10	2000-110	SPACER - ADAPTER MOTOR MOUNT	DP7-A	1
11	7500-030	MOTOR - ROLL UP DOOR	SEW# SA37DRS71S4BE05HR	1
12	7000-706	SHAFT - FLEX ROLLER, DRIVE		1
13	2500-085	KEY - 6mm X 6mm X 32mm		1
14	7000-420L	FRAME - DOOR		1
15	8600-065A	CABLE - RETRACTABLE CORD	AUT# 24237P-36 ...[CUT IN HALF]	1
16	7000-949	PLATE - DOOR, RIGHTHAND INNER		1
17	8000-009	DOOR - VINYL MATERIAL	2222mm X 2200mm X 3mm	1
18	7000-442	PLATE - DOOR CLAMP - INSIDE		1
19	7000-973	PLATE - DOOR CLAMP - OUTSIDE		1
20	8501-053	BUMPER - DOOR SAFETY STRIP	TS-48,74.75,B,AA,FS,OE	1
21	7000-947	PLATE - DOOR, LEFTHAND INNER		1
22	10156	SPACER - DOOR GUIDE		2
23	8501-100	SWITCH - DOOR LIMIT - SAFETY	EUCH# NZ1HS-3131-M	1
24	7000-927	PLATE - SPACER, LOWER		1
25	7000-421	SPACER - DOOR PLATE		1
26	7000-948	PLATE - DOOR, FRONT		2
27	8600-069	ELBOW - 0.25-0.38in X 1/2 KO, CABLE GRIP	MCS# 7466K411	2
28	7000-333	PLATE - SPACER, UPPER		1
29	8501-052	SWITCH - LIMIT	BC# OMRON - D4B-4111N-NPT	1

ROLL UP DOOR DETAIL - LOAD END



CONTROLS DETAIL - LOAD END				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	8501-112	CONTACT - AUX, NC	BBTI# LOVATO - LPXC01	5
2	8501-111	ADAPTER - MOUNTING	BBTI# LOVATO - LPXAU120	12
3	10358	PLATE - LEGEND, LOAD END CONTROL		1
4	8501-110	ACTUATOR - RED MUSHROOM HEAD	BBTI# LOVATO - LPCB6644	2
5	8501-117	SWITCH - SELECTOR 3 POSITION	BBTI# LOVATO - LPCS131	7
6	10359	PLATE - LEGEND, LOAD END CONTROL		1
7	8501-113	CONTACT - AUX, NO	BBTI# LOVATO - LPXC10	20
8	10321	SWITCH - 2 POSITION SELECTOR KEYED	BBTI# LOVATO - LPSS320	1
9	8501-115	BUTTON - RESET	BBTI# LOVATO - LPCBL106	1
10	8501-159	SWITCH - PUSH	BBTI# LOVATO - LPCB102	1
11	3500-636	PLUG - LOCKING PANEL	MCS# 85985K161	1
12	10360	PLATE - LEGEND, LOCK-OUT/E-STOP		1
13	8505-005	LAMP - RESET MODULE	BBTI# LOVATO - LPXLPB6	1

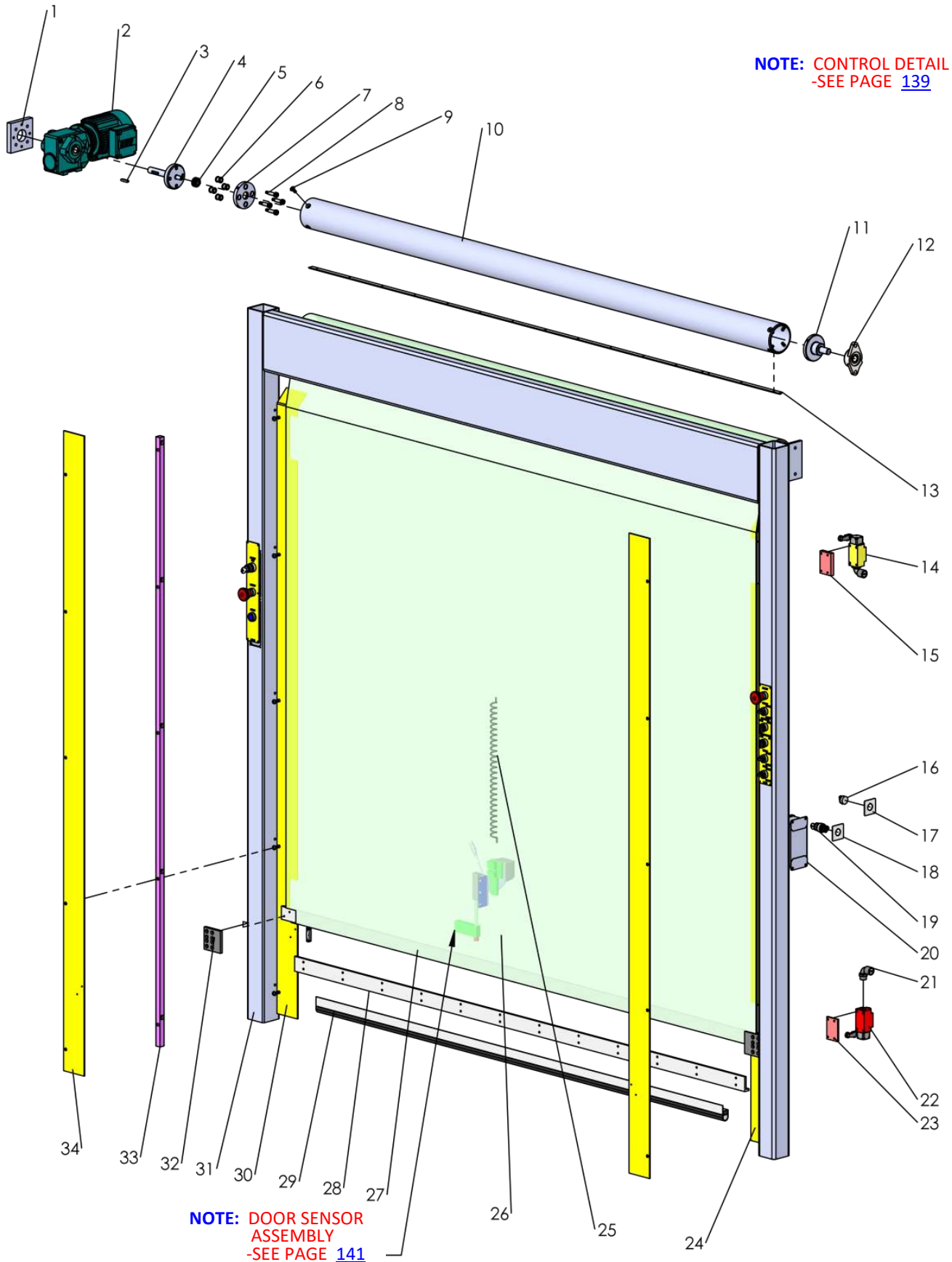
CONTROLS DETAIL - LOAD END



NOTE: PLUG USED ON LEGEND
WHEN SWITCH NOT PRESENT

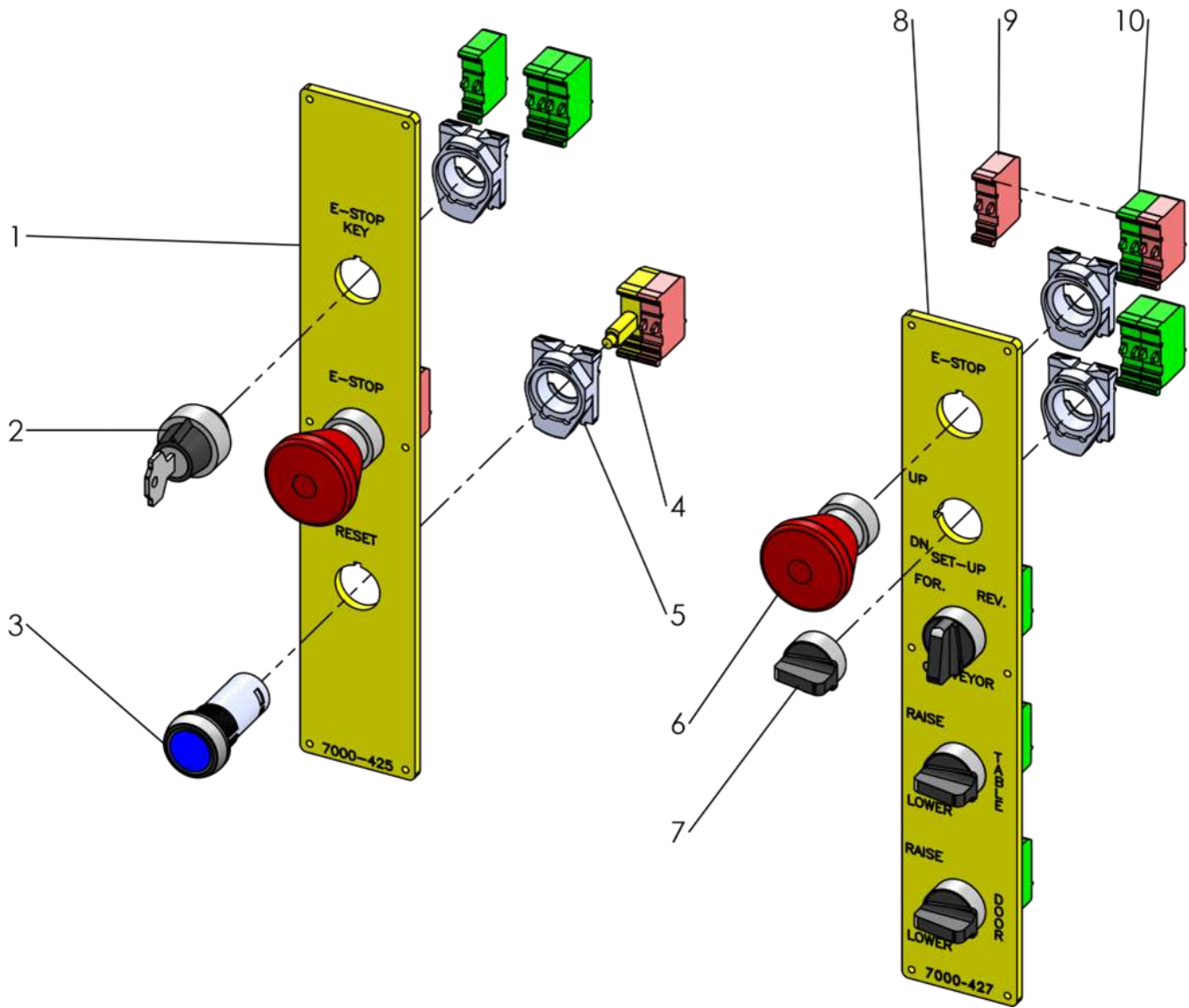
ROLL UP DOOR DETAIL - UNLOAD END				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	2000-110	SPACER - ADAPTER MOTOR MOUNT	DP7-A	1
2	7500-032	MOTOR - ROLL UP DOOR	SEW# SA37DRS71S4BE05HR	1
3	2500-085	KEY - 6mm X 6mm X 32mm		1
4	7000-706	SHAFT - FLEX ROLLER, DRIVE		1
5	4500-277	BEARING - SPHERICAL BALL JOINT, 12mm	MCS# 2995K14	1
6	4500-278	BUSHING - RUBBER GROMMET, 9/16 X 1/2 X 3/8	MCS# 9600K88	4
7	7000-707	PLATE - FLEX ROLLER, DRIVE		1
8	1000-603	SCREW - 10MM X 30MM - M8 X 1.25P THREAD, SHOULDER	MCS# 92981A305	4
9	M8-20-FH	SCREW - M8 X 1.25P X 20mm FHCS	MCS# 91294A284	8
10	7000-708	ROLLER - ROLL UP DOOR		1
11	7000-709	SHAFT - FLEX ROLLER, IDLER		1
12	4500-167	BEARING - 20mm ID, FLANGE	PTI# UCFL204-20	1
13	7000-483	PLATE - VINYL MATERIAL CLAMP SET ...[ONE LONG, ONE SHORT]	MCS# 8124A43	1
14	8501-052	SWITCH - LIMIT	BC# OMRON - D4B-4111N-NPT	1
15	7000-333	PLATE - SPACER, UPPER		1
16	8501-132	SWITCH - 2 POSITION SELECTOR	BBTI# LOVATO - LPCS120	1
17	7000-426	PLATE - LEGEND, BED SUCTION ON/OFF		1
18	10248	LEGEND - TABLE PIN		1
19	10321	SWITCH - KEY SELECTOR, METAL	LPSS320	2
20	8000-077	BOX - 4.9in, JUNCTION		1
21	8600-069	ELBOW - 0.25-0.38in X 1/2 KO, CABLE GRIP	MCS# 7466K411	2
22	8501-100	SWITCH - DOOR LIMIT - SAFETY	EUCH# NZ1HS-3131-M	1
23	7000-927	PLATE - SPACER, LOWER		1
24	7000-949	PLATE - DOOR, REAR 2		1
25	8600-065A	CABLE - RETRACTABLE CORD	AUT# 24237P-36 ...[CUT IN HALF]	1
26	8000-009	DOOR - VINYL MATERIAL	2222mm X 2200mm X 3mm	1
27	7000-442	PLATE - DOOR CLAMP - INSIDE		1
28	7000-973	PLATE - DOOR CLAMP - OUTSIDE		1
29	8501-053	BUMPER - DOOR SAFETY STRIP	TS-48,74.75,B,AA,FS,OE	1
30	7000-947	PLATE - DOOR, REAR 1		1
31	7000-975-06.4	FRAME - DOOR, UNLOAD		1
32	10156	SPACER - DOOR GUIDE		2
33	7000-421	SPACER - DOOR PLATE		1
34	7000-948	PLATE - DOOR, FRONT		2

ROLL UP DOOR DETAIL - UNLOAD END



CONTROLS DETAIL - UNLOAD END				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	10362	PLATE - LEGEND, LOCK-OUT/E-STOP		1
2	10321	SWITCH - 2 POSITION SELECTOR KEYED	BBTI# LOVATO - LPSS320	1
3	8501-115	BUTTON - RESET	BBTI# LOVATO - LPCBL106	1
4	8505-005	LAMP - RESET MODULE	BBTI# LOVATO - LPXLPB6	1
5	8501-111	ADAPTER - MOUNTING	BBTI# LOVATO - LPXAU120	9
6	8501-110	ACTUATOR - RED MUSHROOM HEAD	BBTI# LOVATO - LPCB6644	2
7	8501-117	SWITCH - SELECTOR 3 POSITION	BBTI# LOVATO - LPCS131	4
8	10361	PLATE - LEGEND, CONTROL/E-STOP		1
9	8501-112	CONTACT - AUX, NC	BBTI# LOVATO - LPXC01	7
10	8501-113	CONTACT - AUX, NO	BBTI# LOVATO - LPXC10	12

CONTROLS DETAIL - UNLOAD END

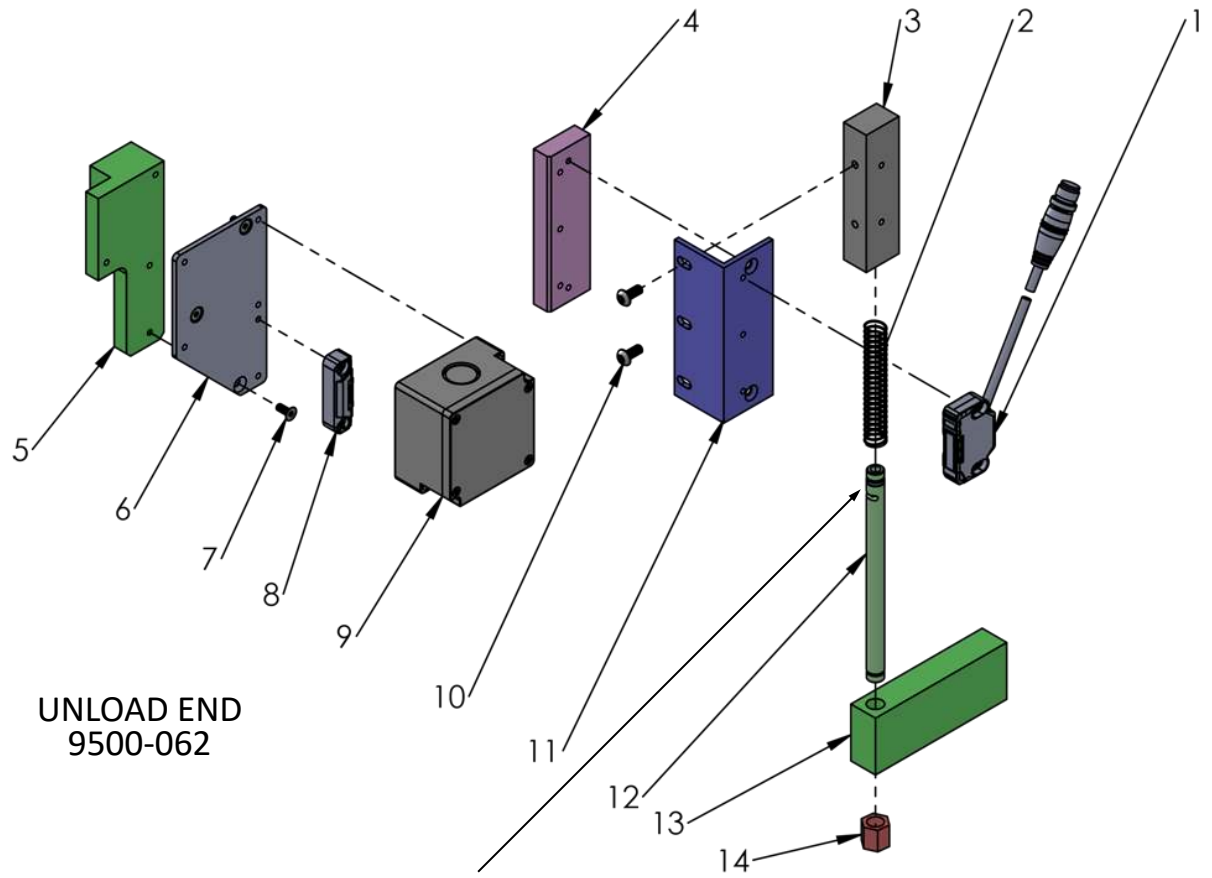


ROLL-UP DOOR SENSOR ASSEMBLY #9500-062 (UNLOAD END)				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	10541	SWITCH - SAFETY	KCA# GS-11PC (SOLD AS SET - ACTUATOR AND SWITCH)	1
2	7600-047	SPRING - STEM	FVSC# 0033425	1
3	7000-256	BLOCK - UPRIGHT BRACKET		1
4	7000-259	BLOCK - SLIDER		1
* 5	7000-255	BRACKET - PLATE, UNLOAD SENSOR		1
* 6	10414	PLATE - ADAPTOR		1
7	M4-10-FH	SCREW - M4 X .07P X 10mm FHCS	MCS# 92125A190	3
8	10541	ACTUATOR - SAFETY	KCA# GS-11PC (SOLD AS SET - ACTUATOR AND SWITCH)	1
9	10415	BOX - JUNCTION	LC# 4PT-GS	1
10	10091	SCREW - M5 X .08P X 12mm BHCS SECURITY TORX	MCS# 91900A856	2
11	7000-258	BRACKET - ANGLE		1
12	6500-024	STEM - 10mm OD X 6mm ID		1
13	7000-257	BLOCK - MOUNTING DOOR SENSOR		1
14	1500-051	CAP - 1/8 NPT, STEEL	MCS# 4638K251	1

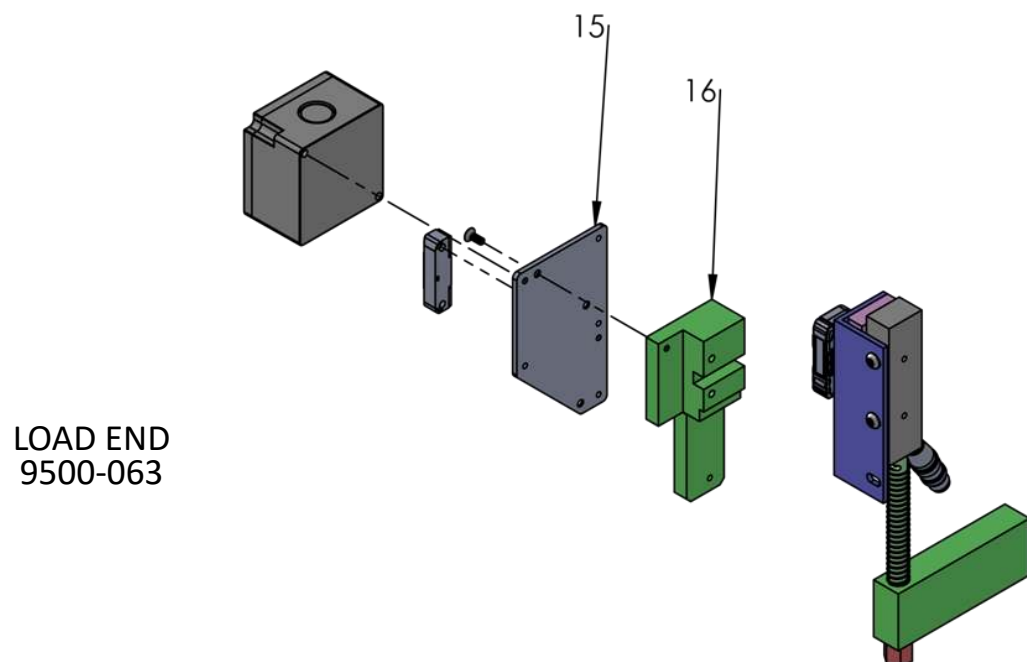
ROLL-UP DOOR SENSOR ASSEMBLY #9500-063 (LOAD END)				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
* 15	10417	PLATE - ADAPTOR, LOAD DOOR BOX		1
* 16	7000-254	BRACKET - PLATE, LOAD SENSOR		1

* FOR REFERENCE ONLYLOAD OR UNLOAD LOCATION

ROLL UP DOOR SENSOR ASSEMBLY

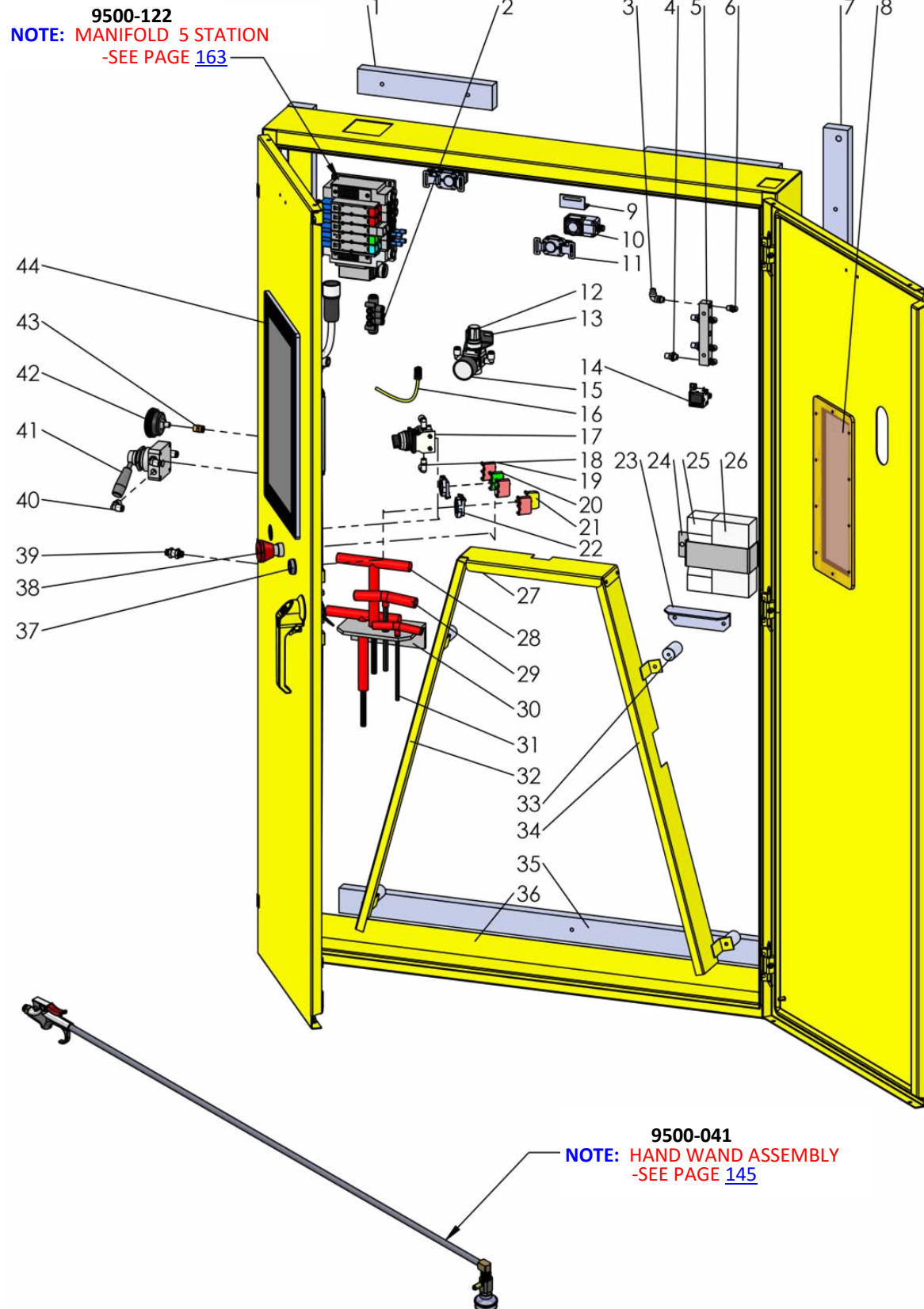


NOTE: MACHINED GROOVE MUST
BE IN UP POSITION
WHEN ASSEMBLING



GUARD - OPERATOR SIDE DETAIL				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	10074	SPACER - OP / SPRAG CABINETS, UPPER		2
2	3500-065	MANIFOLD - 6 PORT	SMC# KM11-06-10-06	1
3	3500-060	ELBOW - 6mm X 1/8 BSPP, GREASE FITTING	MSC# 08037285	1
4	3500-059	STRAIGHT - 6mm X 1/8 BSPP, GREASE FITTING	MSC# 08038861	3
5	3500-074	MANIFOLD - GREASE	GL1	1
6	3500-063	ELBOW - 1/8 PTF, GREASE FITTING	MCS# 1095K27	4
7	10082	SPACER - OP CABINET, SIDE		2
8	8505-008	WINDOW - CABINET		1
9	10416	BRACKET - SAFETY SWITCH, CABINET		2
10	10425	SWITCH - INTERLOCK	KEYENCE# GS-ML51	2
11	10426	ACTUATOR - INTERLOCK	KEYENCE # 500N GS-MAL5M	2
12	7600-037	REGULATOR - PRESSURE, 1/8 RPT PORTS	SMC# AR20-01-B	1
13	7000-221	BRACKET - REGULATOR	SMC# AW23P-270AS	1
14	10572	SWITCH - DIGITAL PRESSURE	SMC# ISE20-P-C6L-LA2	1
15	7600-036	GAUGE - PRESSURE	SMC# K40-MP1.0-01MS	1
16	8600-074	CABLE - CAT5	BELKIN# A3L980-07-YLW-S	1
17	7600-035	SWITCH - HAND WHEEL BRAKE	SMC# VM130-N01-34BA	1
18	3500-306	ELBOW - 6mm X 1/8 RPT	SMC# KQ2L06-01AS	4
19	8501-112	CONTACT - AUX, NC	BBTI# LOVATO - LPXC01-AUX	3
20	8501-113	CONTACT - AUX, NO	BBTI# LOVATO - LPXC10-AUX	1
21	8505-005	LAMP - RESET MODULE	BBTI# LOVATO - LPXLPB6	1
22	8501-111	ADAPTER - MOUNTING	BBTI# LOVATO - LPXAU120	2
23	10154	BRACKET - TOOL HOLDER BOTTOM		1
24	7000-436	BRACKET - V-BLOCK		1
25	7000-437	BLOCK - V, SLEEVE CHANGE		1
26	7000-438	SPACER - SLEEVE CHANGE		1
27	7000-971	GUARD - DRIVE CHAIN, TOP		1
28	9000-071	WRENCH - T, JACKING HANDLE	M10 X 1.25P THREAD	2
29	9000-073	WRENCH - T, 8mm HEX HANDLE	MCS# 6954A37	1
30	7000-439	BRACKET - T-WRENCH HOLDER	TW1-A	1
31	9000-074	WRENCH - T, 6mm HEX HANDLE	MCS# 6954A36	1
32	7000-451	GUARD - DRIVE CHAIN, LEFT		1
33	7000-970	SPACER - CHAIN GUARD		4
34	7000-452	GUARD - DRIVE CHAIN, RIGHT		1
35	10083	SPACER - OP CABINET, BOTTOM		1
36	8000-022	GUARD - OPERATOR SIDE	BMI3-674005WFLP	1
37	8501-115	BUTTON - RESET	BBTI# LOVATO - LPCBL106	1
38	8501-110	ACTUATOR - RED MUSHROOM HEAD	BBTI# LOVATO - LPCB6644	1
39	3500-302	STRAIGHT - 6mm X 6mm, BULKHEAD	SMC# KQ2E06-00A	1
40	3500-307	ELBOW - 6mm X 1/4 RPT	SMC# KQ2L06-02AS	3
41	7600-034	VALVE - DIRECTIONAL, 3 POSITION	SMC# VH211-02 - 3 POSITION	1
42	7600-062	GAUGE - PRESSURE	SMC# G46-P10-N01-C-X30	1
43	3500-073	UNION - 1/8 NPT, FEMALE COUPLING, BRASS	MSC# 83294728	2
44	8500-041	DISPLAY - HMI 15" EXOR	BBTI# EXOR - EX715 - 15INCH, 24V	1

GUARD - OPERATOR SIDE DETAIL



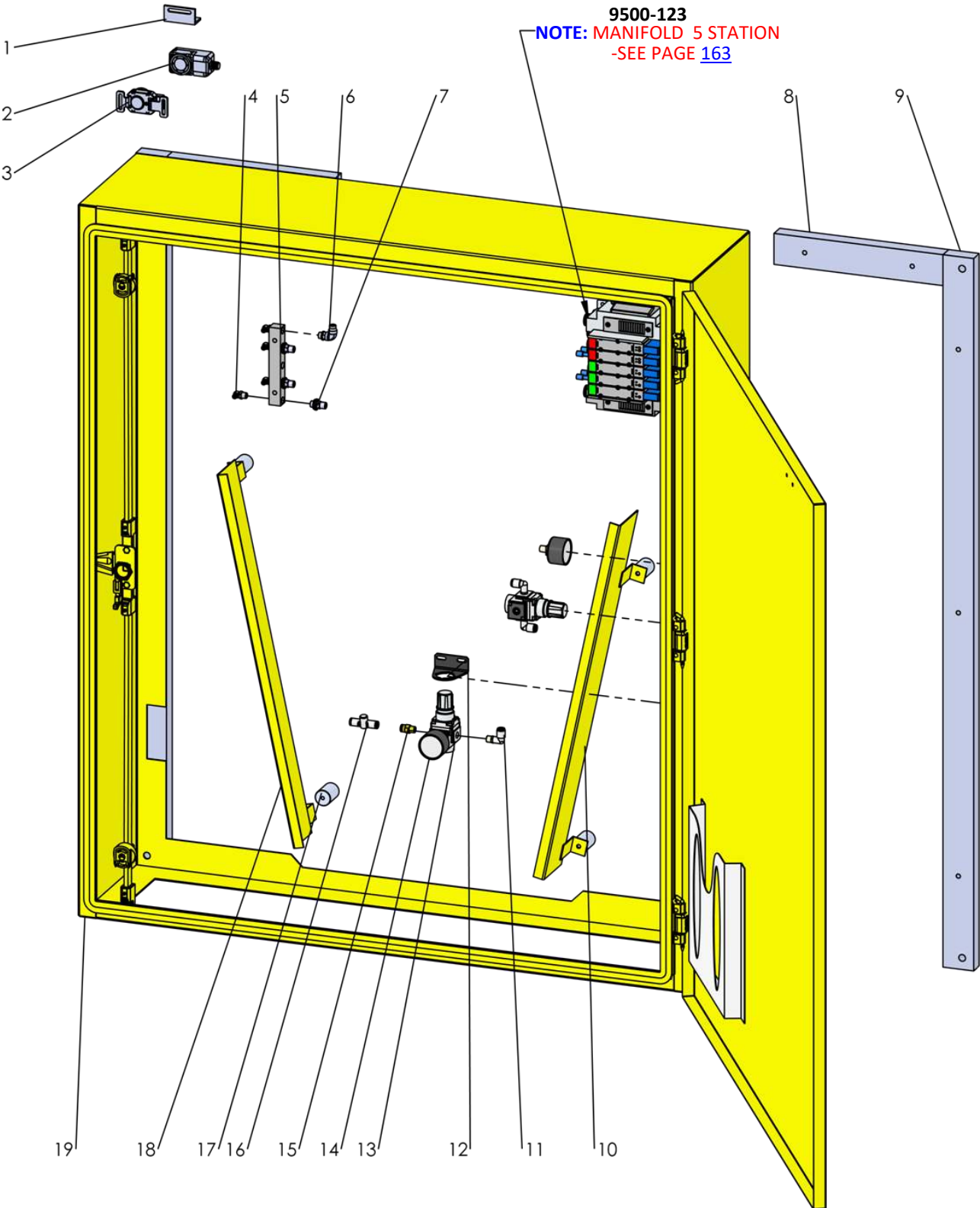
HAND WAND ASSEMBLY #9500-041				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	6500-021	TUBING - 6mm, COIL	SMC# TCU0604B-1	1
2	3500-328	STRAIGHT - 6mm X 1/4 RPT	SMC# KQ2H06-02AS	1
3	4000-053	HANDLE - BLOW GUN	MCS# 5650K13	1
4	6500-017	TUBE - SEAMLESS ALUMINUM ... (ENDS NEEDS TO BE THREADED)	MCS# 89965K47	1
5	3500-037	ELBOW - 1/8 NPT X 1/8NPT, MALE / FEMALE, BRASS	MCS# 50785K41	1
6	4900-036	GENERATOR - VACUUM	AS# ER10-18F	1
7	3500-033	ADAPTER - VACUUM	E.L. SIMETH# HS6-18M-G	1
8	4900-018BU	CUP - B30	VC# B30 1/4 HL.17 STEM	1
9	3500-010	SCREW - PB40 FIXING M6		1

HAND WAND ASSEMBLY



GUARD - SPRAG SIDE DETAIL				
ITEM	PART NUMBER	DESCRIPTION	COMMENTS	QTY
1	10416	BRACKET - SAFETY SWITCH, CABINET		1
2	10425	SWITCH - INTERLOCK	KEYENCE# GS-ML51	1
3	10426	ACTUATOR - INTERLOCK	KEYENCE # 500N GS-MAL5M	1
4	3500-063	ELBOW - 1/8 PTF, GREASE FITTING	MCS# 1095K27	4
5	3500-074	MANIFOLD - GREASE	GL1	1
6	3500-060	ELBOW - 6mm X 1/8 BSPP, GREASE FITTING	MSC# 08037285	1
7	3500-059	STRAIGHT - 6mm X 1/8 BSPP, GREASE FITTING	MSC# 08038861	3
8	10074	SPACER - OP / SPRAG CABINETS, UPPER		2
9	10073	SPACER - SPRAG CABINET, SIDE		2
10	7000-453	GUARD - SPRAG CHAIN, RIGHT		1
11	3500-306	ELBOW - 6mm X 1/8 RPT	SMC# KQ2L06-01AS	3
12	7000-221	BRACKET - REGULATOR	SMC# AW23P-270AS	2
13	7600-037	REGULATOR - PRESSURE, 1/8 RPT PORTS	SMC# AR20-01-B	2
14	7600-036	GAUGE - PRESSURE	SMC# K40-MP1.0-01MS	2
15	3500-304	STRAIGHT - 6mm X 1/8 RPT	SMC# KQ2H06-01AS	1
16	3500-337	MUFFLER - 6mm X 6mm, INLINE QUICK EXHAUST	SMC# AQ340F-06-00	1
17	10087	SPACER - CHAINGUARD		4
18	7000-454	GUARD - SPRAG CHAIN, LEFT		1
19	8000-021	GUARD - SPRAG SIDE		1

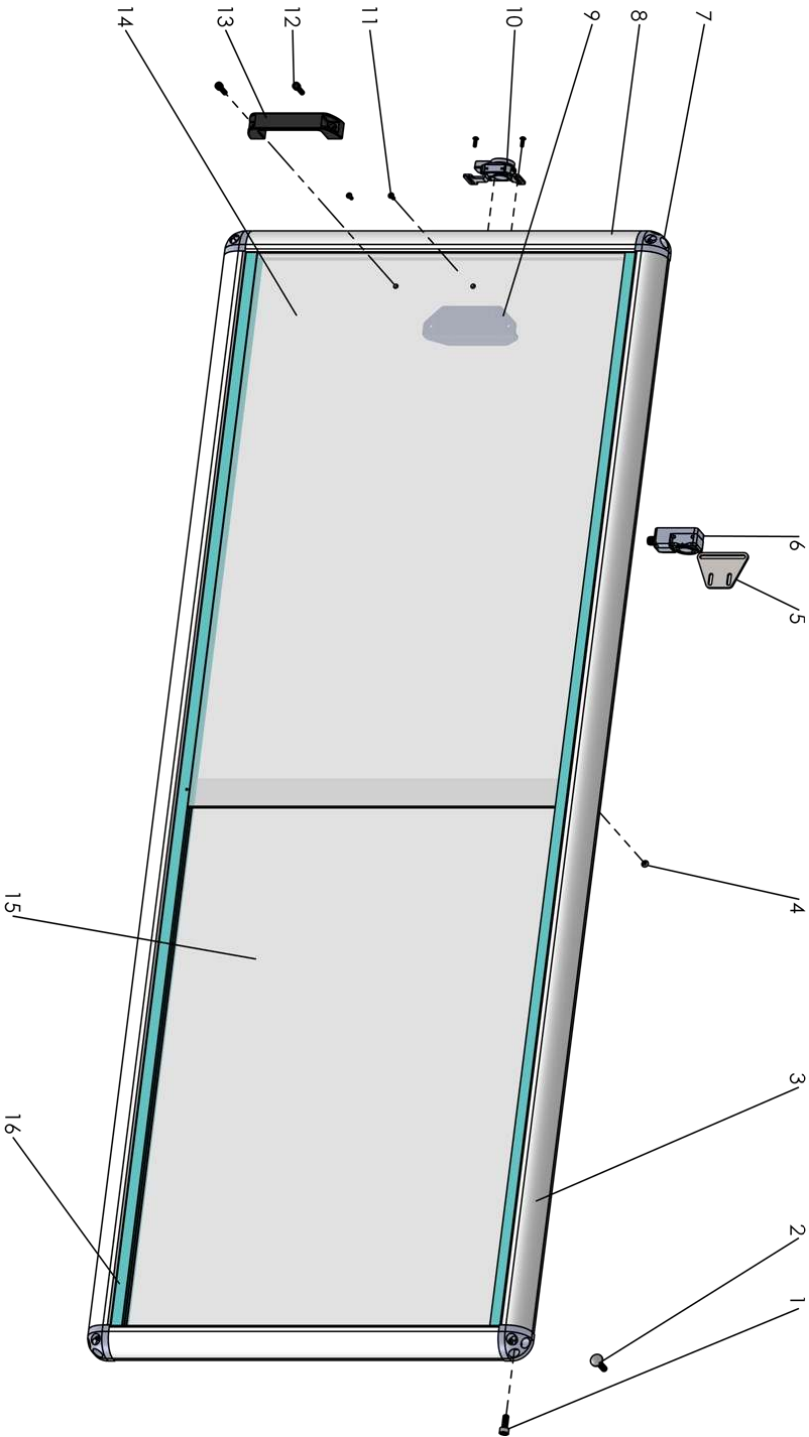
GUARD - SPRAG SIDE DETAIL



WINDOW DETAIL				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	M8-20-SH	SCREW - M8 X 1.25P X 20mm SHCS	MCS# 91290A426	8
2	1000-620	STUD - FLANGED, M8 X 1.25P X 35mm	80/20# 19-8935	8
3	7000-440	TRIM - WINDOW, HORIZONTAL	80/20# 40-4030 LITE X 1640MM	2
4	10575	RIVET - BLIND, DOME HEAD	MCS# 97447A714	2
5	10479	PLATE - INTERLOCK SWITCH MOUNT		1
6	10425	SWITCH - INTERLOCK	KEYENCE# GS-ML51	1
7	7000-727	BRACKET - ROUNDED CORNER, 3 WAY	80/20# 40-4443	4
8	7000-441	TRIM - WINDOW, VERTICAL	80/20# 40-4030 LITE X 590MM	2
9	10419	BRACKET - BACKING, WINDOW HANDLE		1
10	10426	ACTUATOR - INTERLOCK	KEYENCE # 500N GS-MAL5M	1
11	10137	SCREW - TAMPER RESISTANT BUTTON	MCS# 91900A853	4
12	M6-25-SH	SCREW - M6 X 1.0P X 25MM SHCS	MCS# 91290A330	2
13	10402	HANDLE - NYLON WINDOW	JWW# MF-24.5-B6.5-117-SW	1
14	8505-004	PANE - WINDOW, OUTER	LEXON - 33.25in X 22.75in X 0.25in	1
15	8505-017	PANE - WINDOW, FIXED	LEXON - 33.25in X 22.75in X 0.25in	1
16	7000-823	TRACK - SLIDE, WINDOW	80/20# 40-2210 X 1640MM	2

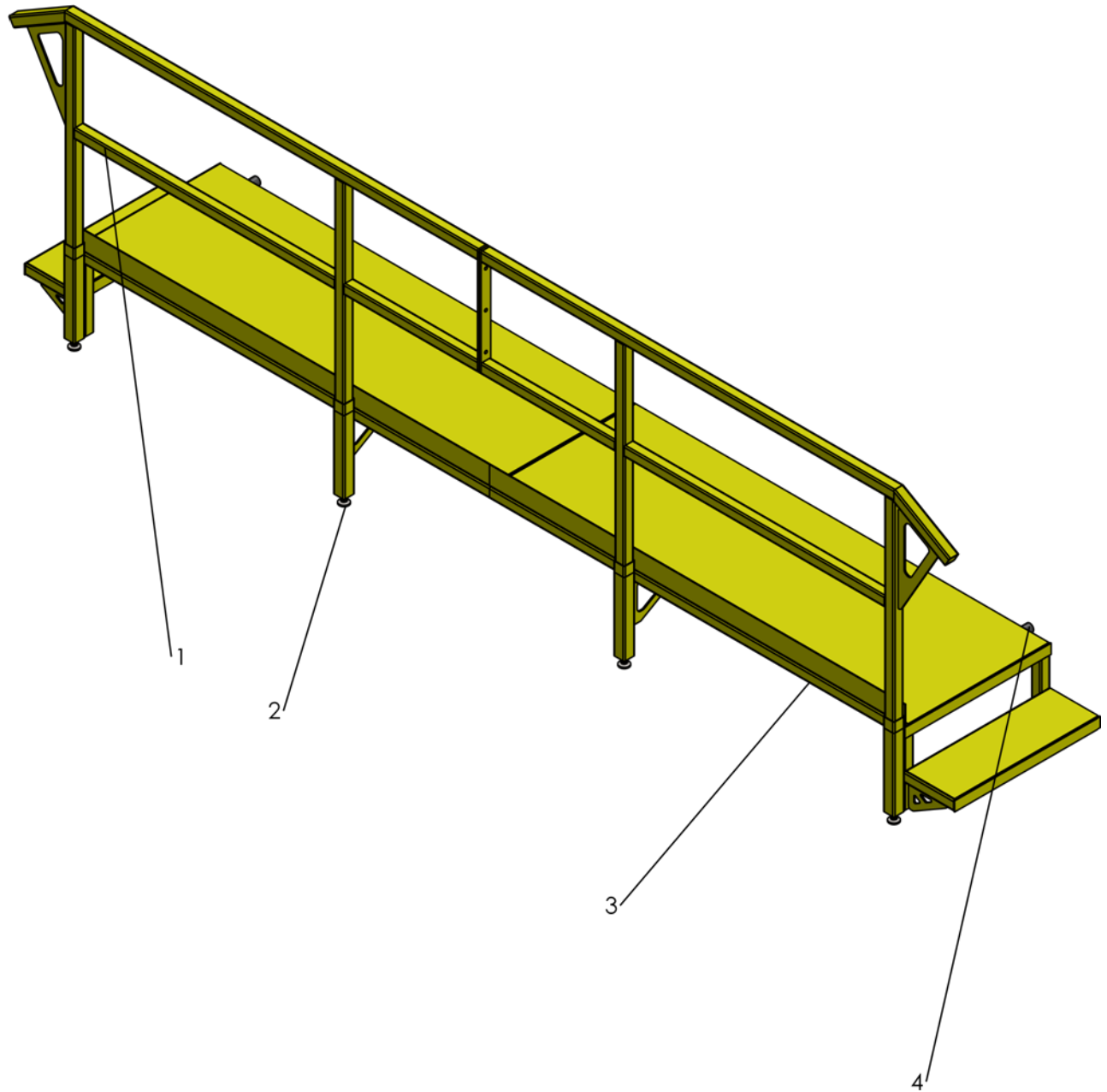
WINDOW DETAIL

ORIENTATION OF SPRAG UNLOAD AND OPERATOR LOAD WINDOW.
SPRAG LOAD AND OPERATOR UNLOAD WINDOW IS MIRRORED



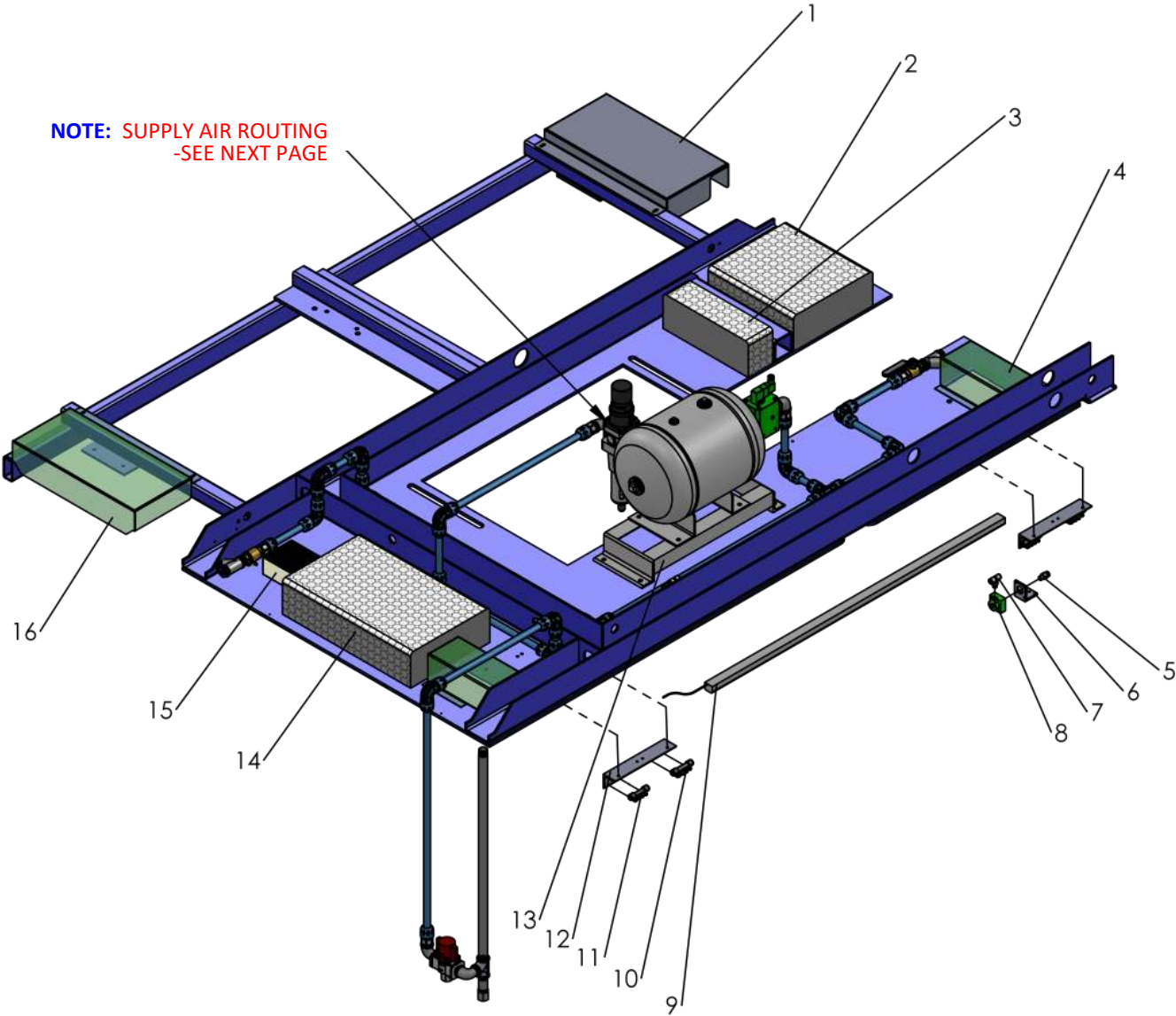
WALKWAY ASSEMBLY #7000-434B				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	7000-434B-H	WELDMENT - HANDRAIL		2
2	1000-449	MOUNT - SWIVEL LEVELING FOOT	MCS# 6301K740	6
3	7000-434B-D	WELDMENT - DECK		2
4	10493	BUMPER - CATWALK 40 X 40-M8	JWW# 352-40-40-M8-S-70	

WALKWAY DETAIL



ROOF DETAIL				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	7000-457	COVER - UNLOAD CRANKARM, SP		1
2	8501-138	REGEN - SERVO ENERGY DUMP - MED	BBTI# POST GLOVER - DB40100-0300-10200AD0	1
3	8501-167	REGEN - SERVO ENERGY DUMP - SM	BBTI# POST GLOVER - DB0100-0300-10000AA0	1
4	7000-455	COVER - LOAD CRANKARM		2
5	3500-503	STRAIGHT - 10mm X 1/4 RPT	SMC# KQ2H10-02S	2
6	7000-486	BRACKET - QUICK RELEASE MOUNT		2
7	3500-506	TEE - 10mm X 10mm X 1/4 RPT, BRANCH	SMC# KQ2T10-02AS	2
8	7600-016	VALVE - QUICK RELEASE	SMC# NAQ2000-02	2
9	8505-009	LIGHT - LED 24 VOLT, STRIP	BBTI# CLA12S-24-CD 120mm LONG	2
10	3500-040	MANIFOLD - 08-10-3	SMC# KM13-08-10-3	2
11	3500-039	MANIFOLD - 06-10-3	SMC# KM13-06-10-3	2
12	7000-482	BRACKET - MANIFOLD MOUNT		2
13	8506-006	BASE - COMPRESSOR TANK MOUNT, 7 GAL		1
14	8501-139	REGEN - SERVO ENERGY DUMP - LG	BBTI# POST GLOVER - DB15D5-3K20-10400AA0	1
15	8501-137	HORN - WARNING SIGNAL	MCS# 59835T83	1
16	7000-458	COVER - UNLOAD CRANKARM, OP		1

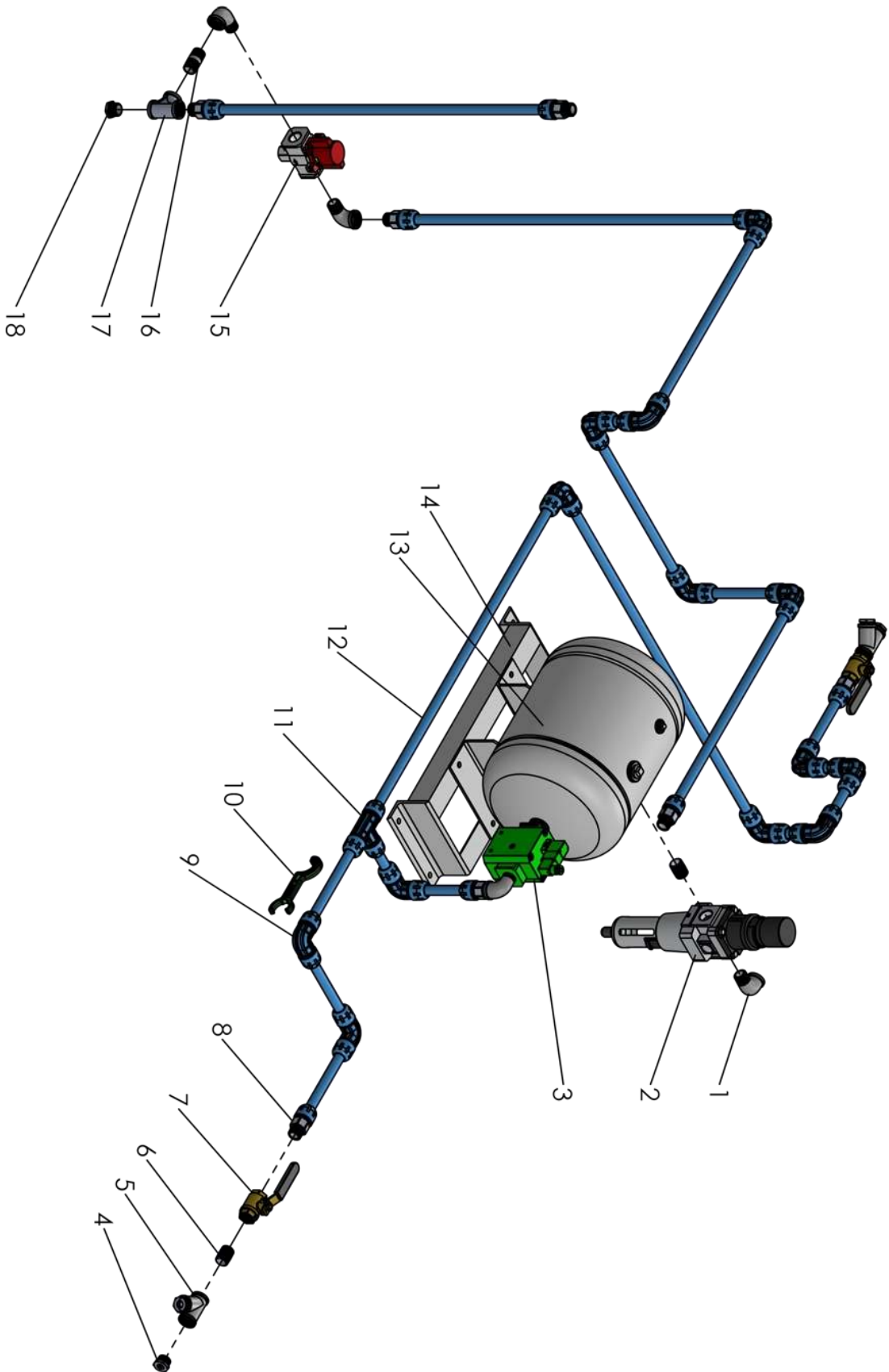
ROOF DETAIL



SUPPLY AIR ROUTING - (7 GAL EXPORT - CE APPROVED)				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	6500-040	ELBOW - 0.75 NPT, FEMALE/MALE, STAINLESS STEEL	MCS# 4464K39	4
2	7600-048	REGULATOR - PRESSURE, FILTER COMBO, MAIN	SMC# AW60-N06DE-Z-B	1
3	7600-061	VALVE - SOFT START UP	SMC# AV5000-N06-5DZ	1
4	6500-048	ADAPTER - 0.75 NPT MALE X 0.25 NPT FEMALE, SS	MCS# 4464K268	4
5	6500-043	WYE - 0.75 NPT, STAINLESS STEEL	MCS# 4464K756	2
6	6500-047	PIPE - 0.75 NPT X 1.375in, STAINLESS STEEL	MCS# 4830K191	4
7	7600-065	VALVE - 0.75 NP, BALL	MCS# 47865K24	2
*8	6500-100-02	FITTING - , 3/4" X 3/4" NPT MALE	FAST PIPE# F1118	7
*9	6500-100-03	FITTING - , 3/4" 90 DEGREE ELBOW	FAST PIPE# F1003	13
*10	6500-100-05	SPANNER - , 3/4" WRENCH	FAST PIPE# F1020	1
*11	6500-100-04	FITTING - , 3/4" EQUAL TEE	FAST PIPE# F1005	1
*12	6500-100-01	TUBING - 1" ALUMINUM (7' - 6" STOCK)	FAST PIPE# F1863	1
13	8000-018	TANK - AIR, 7 GAL EXPORT CE APPROVED	MCS# 9888K15	1
14	8506-006	BASE - COMPRESSOR MOUNT, 7 GALLON		1
15	7600-063	VALVE - SINGLE ACTION RELIEF	SMC# VHS50-N06A-RZ	1
16	6500-053	PIPE - 0.75 NPT X 2.0in, STAINLESS STEEL	MCS# 4830K193	1
17	6500-050	TEE - 0.75 NPT, STAINLESS STEEL	MCS# 4464K52	1
18	10622	PIPE - 0.75 NPT PLUG, STAINLESS STEEL	MCS# 4464K255	1

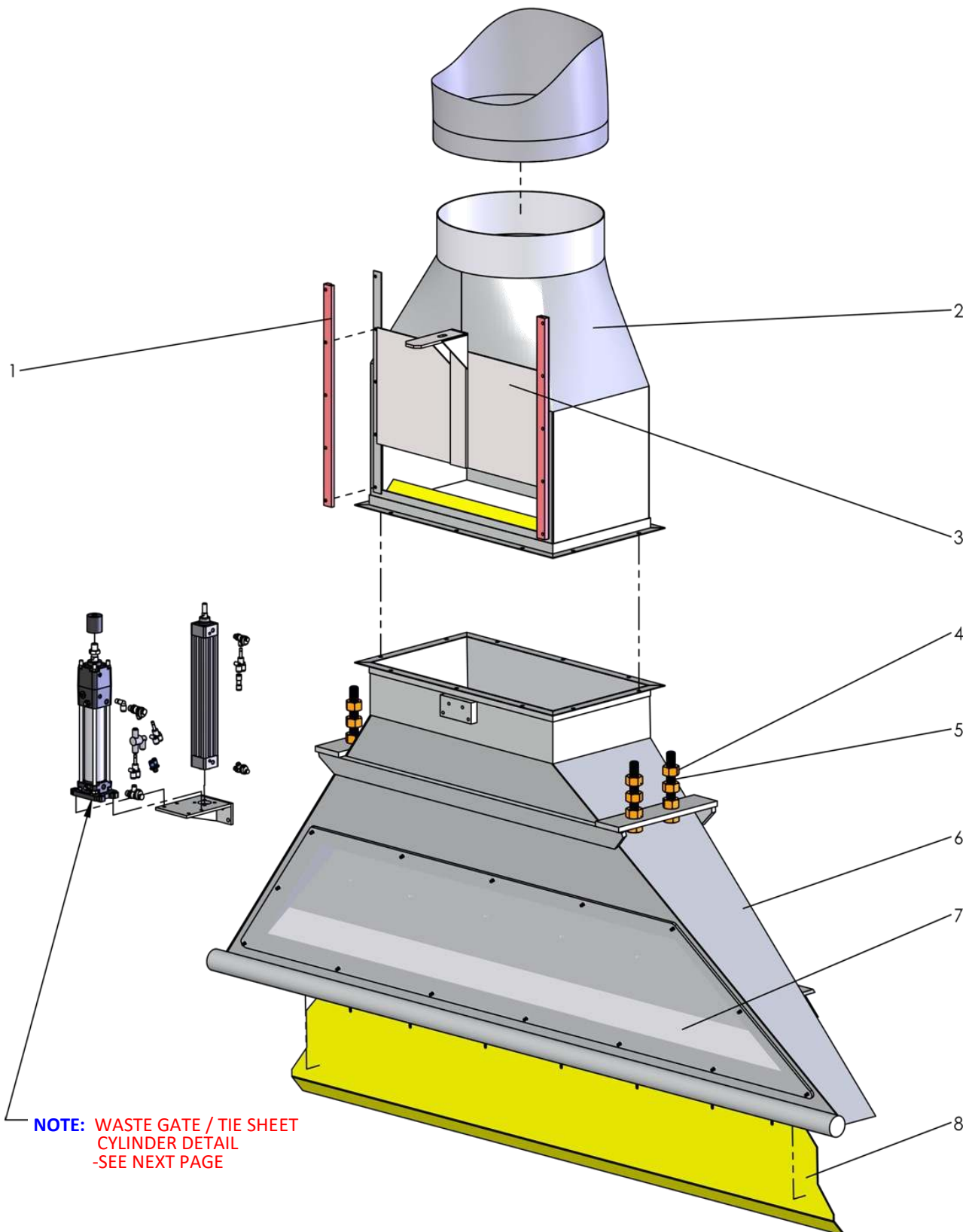
*	NOTE	FAST PIPE - EACH KIT TO CONSIST OF...		1
	6500-100	(3) PCS-F1863, (5) PCS-F118, (13) PCS - F1003, (1) PC- F1005, (2) PCS- F1020		

SUPPLY AIR ROUTING



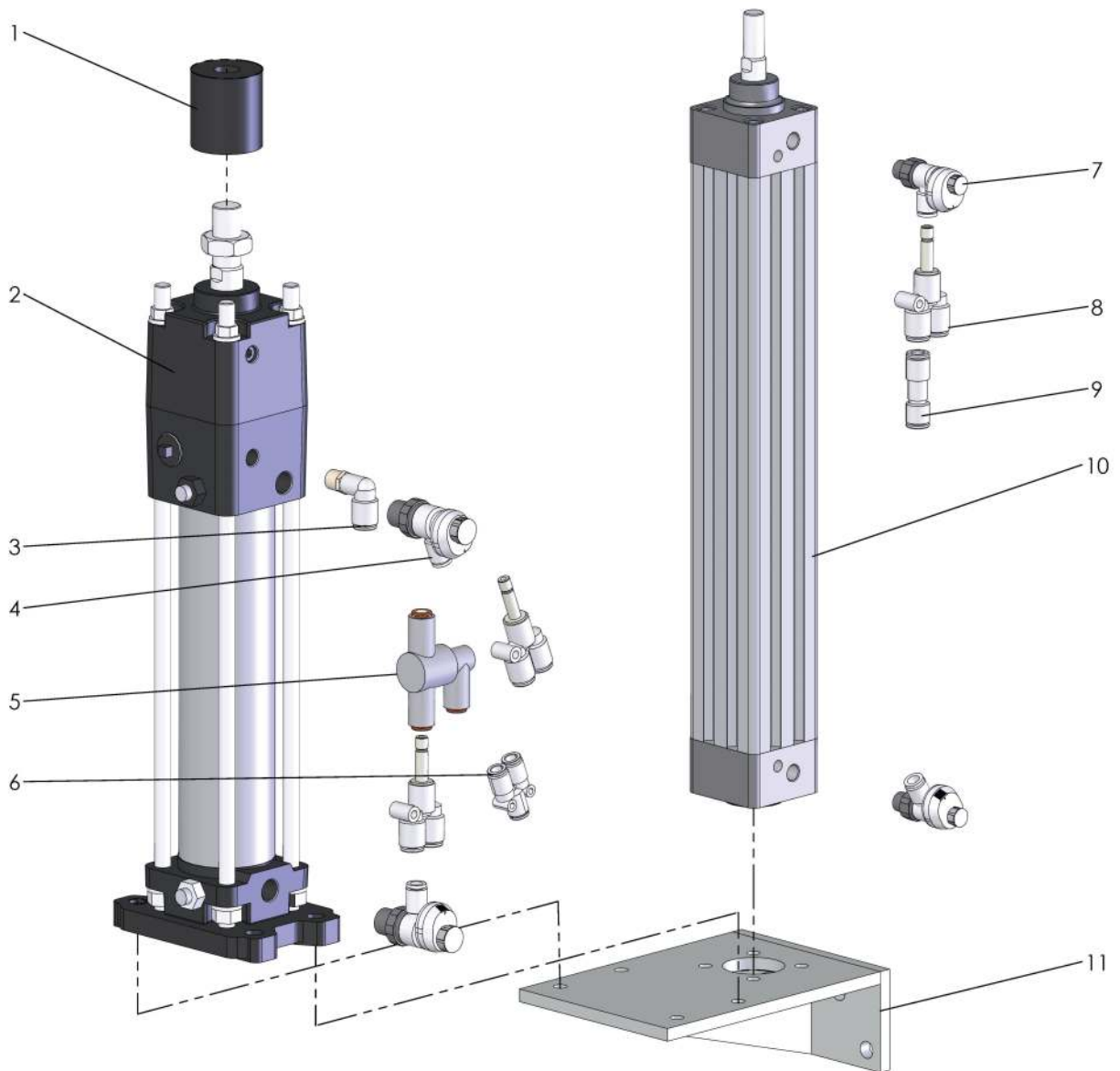
WASTE HOOD DETAIL				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	7000-432	TRACK - RELIEF GATE, LEFT		1
2	7000-429	WELDMENT - GATE HOOD		1
3	7000-430	PLATE - GATE RELIEF DOOR		1
4	M20-HEX	NUT - M20 x 2.5P STD	MCS# 90591A230	16
5	1000-558	ROD - M20 X 2.5P X 152mm LONG, READY THREAD	MCS# 99067A136	4
6	7000-431	WELDMENT - WASTE HOOD		1
7	8505-001	WINDOW - WASTE HOOD		1
8	7000-219	SCRAPER - WIPER		1

WASTE HOOD DETAIL



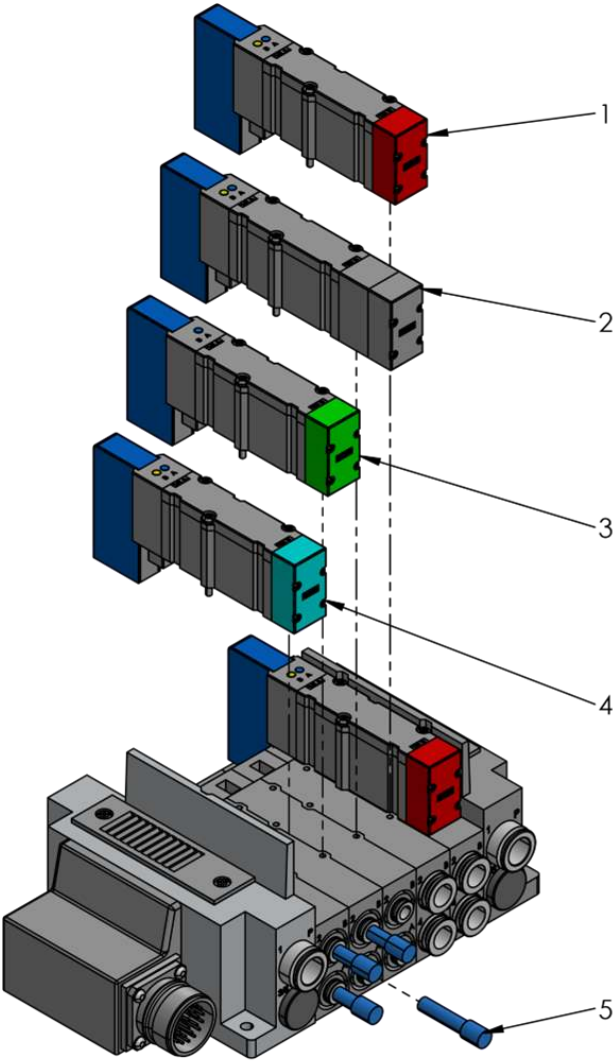
WASTE GATE / TIE SHEET DETAIL				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	4200-033	BUMPER - .375in ID X 1.5in OD CUT TO LENGTH	MCS# 8637K21	1
2	4200-021	CYLINDER - WASTE GATE	SMC# CNA2G40-150-D	1
3	3500-306	ELBOW - 6mm X 1/8 RPT	SMC# KQ2L06-01AS	1
4	10387	FITTING - 1/4 in SPEED CONTROLLER / INDICATOR	SMC# AS2201FS-02-06S	2
5	7600-039	VALVE - SHUTTLE	SMC# VR1220F-06	1
6	3500-322	UNION - 6MM "Y" FITTING	SMC# KQ2U06-00A	1
7	10386	FITTING - 1/8 in SPEED CONTROLLER / INDICATOR	SMC# AS2201FS-01-06S	2
8	3500-324	FITTING - 6mm PLUG IN "Y"	SMC# KQ2U06-99A	3
9	10375	VALVE - CHECK, 6mm STRAIGHT	SMC# AKH06-00	1
10	4200-022	CYLINDER - TIE SHEET	SMC# CP96SB32-250C	1
11	7000-475	BRACKET - WASTE GATE CYLINDER MOUNT		1

WASTE GATE / TIE SHEET DETAIL



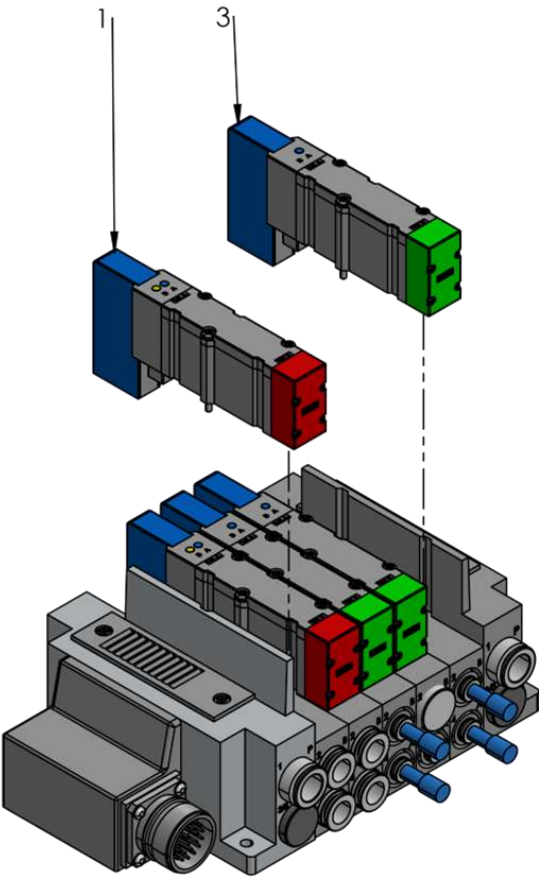
Air Schematics

MANIFOLD 5 STATION ASSEMBLY #9500-122 - #9500-123				
ITEM	PART NO.	DESCRIPTION	COMMENTS	QTY
1	10393	SOLENOID VALVE	SMC# SY7A00-5U1	4
2	10401	SOLENOID VALVE	SMC# SY7400-5U1	1
3	10394	SOLENOID VALVE	SMC# SY7100-5U1-NA	4
4	10400	SOLENOID VALVE (DOUBLE ACTION)	SMC# SY7200-5U1	1
5	3500-308	PLUG - 6MM	SMC# KQ2P-06	8



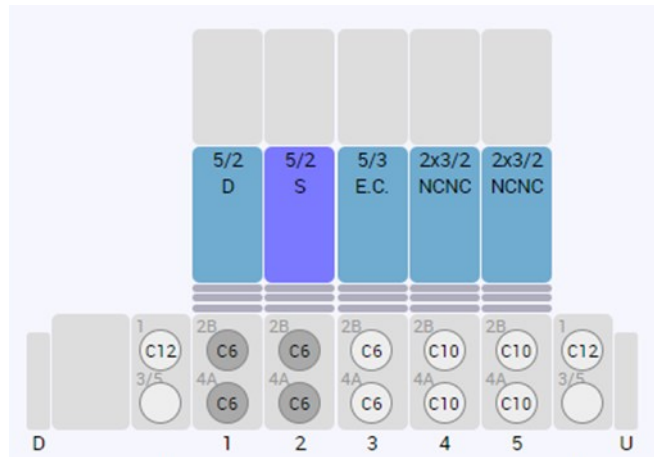
9500-122
OPERATOR MANIFOLD

SOLENOID REPLACEMENT REFERENCE



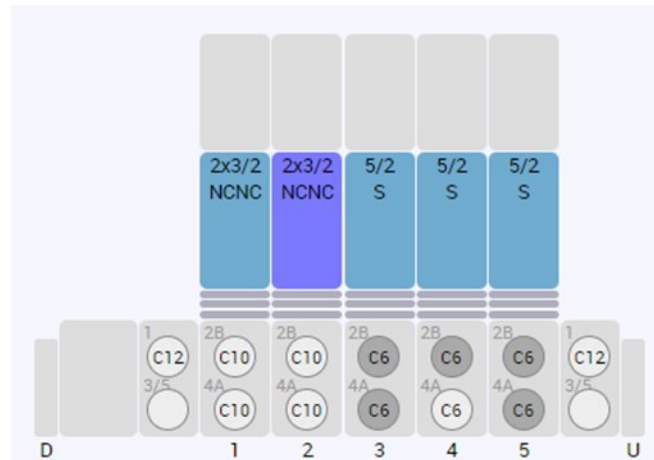
9500-123
SPRAG MANIFOLD

MANIFOLD 5 STATION - OPERATOR SIDE (9500-122)



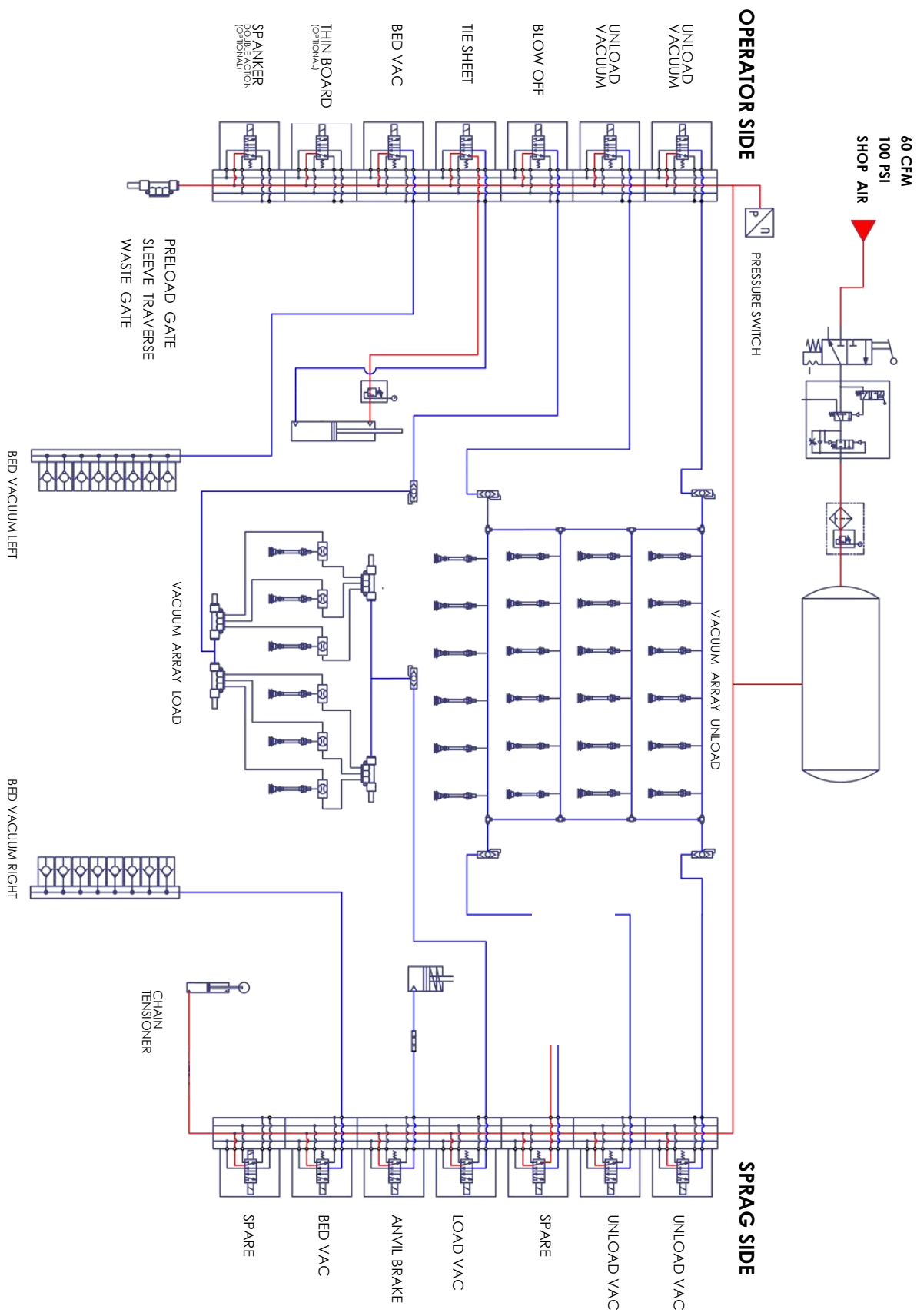
Baysek	SMC	Station	Description	Sol - terminal - wire color
10400	SY7200-5U1	1	Spanker	A - 1 Black
				B - 2 Brown
10394	SY7100-5U1	2	Thin Board	A - 3 Red
10401	SY7400-5U1	3	Tie Sheet	A - 5 Yellow
				B - 6 Pink
10393	SY7A00-5U1	4	Unload Vacuum	A - 7 Blue
			Bed Vacuum	B - 8 Purple/White dot
10393	SY7A00-5U1	5	Unload Vacuum	A - 9 Gray/Black dot
			Load Blow Off	B - 10 White/Black dot

MANIFOLD 5 STATION - SPRAG SIDE (9500-123)

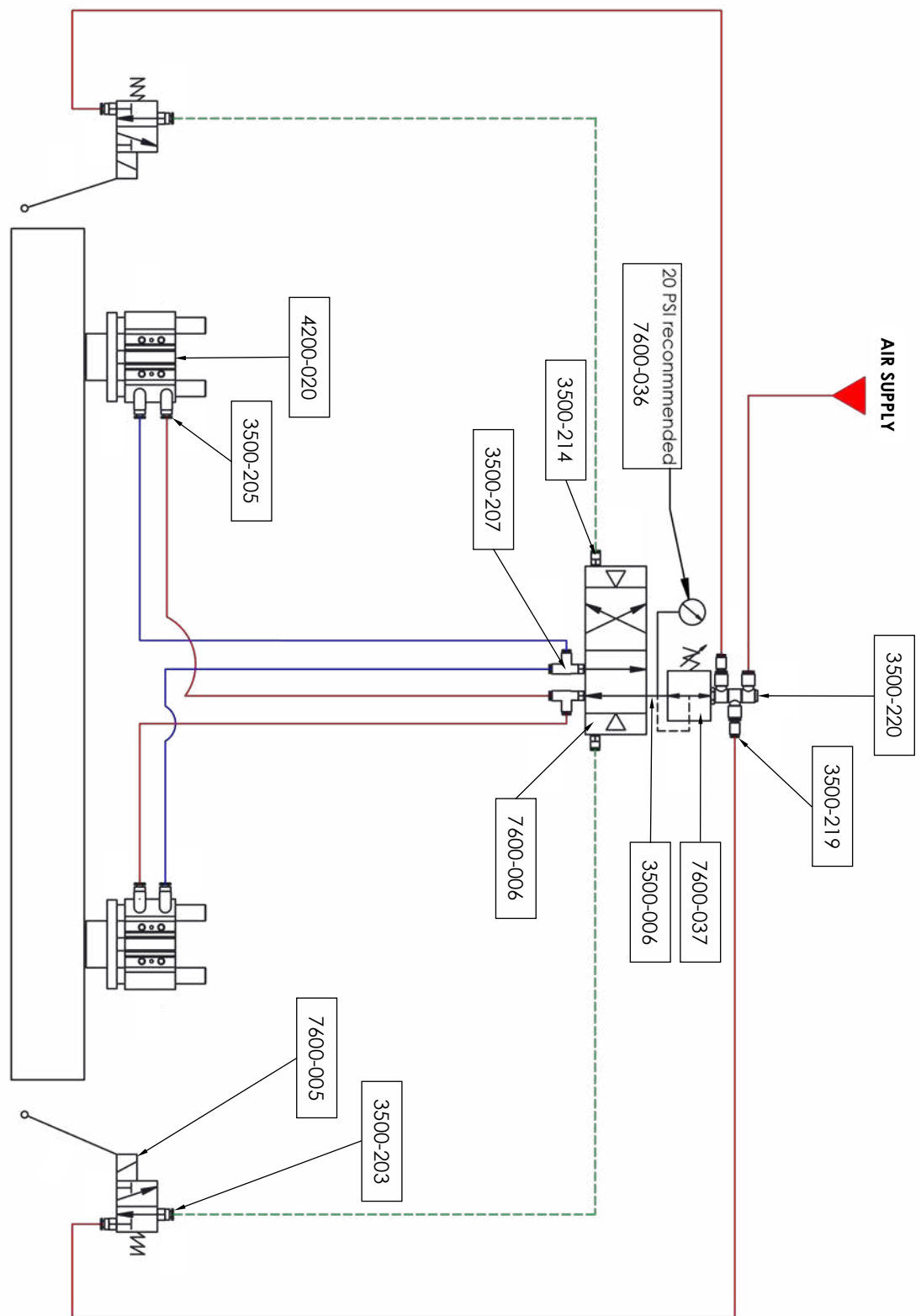


Baysek	SMC	Station	Description	Sol - terminal - wire color
10393	SY7A00-5U1	1	Unload Vacuum	A - 1 Black
			Bed Vacuum	B - 2 Brown
10393	SY7A00-5U1	2	Unload Vacuum	A - 3 Red
			Load Vacuum	B - 4 Orange
10394	SY7100-5U1	3	Spare	A - 5 Yellow
10394	SY7100-5U1	4	Anvil Brake	A - 7 Blue
10394	SY7100-5U1	5	Spare	A - 9 Gray/Black dot

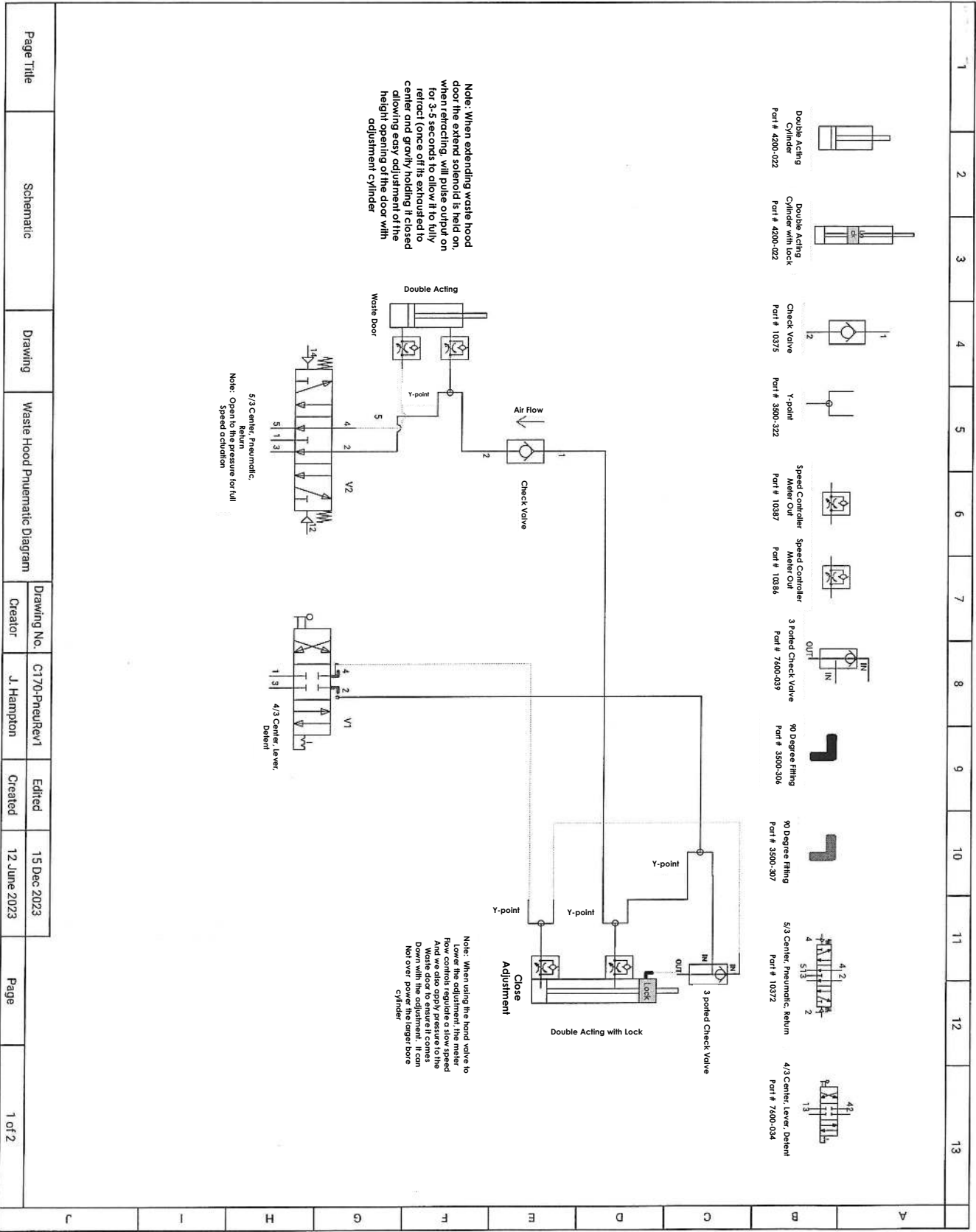
LOAD / UNLOAD AIR SYSTEM SCHEMATICS



SLEEVE TRAVERSE AIR SYSTEM SCHEMATIC



WASTE GATE / TIE SHEET SYSTEM SCHEMATICS



Troubleshooting

MINOR FAULT TROUBLESHOOTING

The machine won't start

- Go to the Home screen. The "System Enable" button should be green.
- Check Alarms screen for faults.
- Go to the Guard Status screen. All doors, windows, cabinets, and E-Stops should be green.
- Go to the Inputs screen. All of the label tags should be green.
- Open the right door on the electrical cabinet. Verify all of the circuit breakers are not tripped.
- Motion Controller Alarmed – If the HMI operator interface has dash marks for Units Complete Value or near the value this indicates a failure in communications to the controller. The Red alarm LED t on the MP2300Slec or MP3300iec controller (located in electrical enclosure) will be on. 
- Verify proper 3 Phase supply voltage. (Only a qualified electrician should check for correct voltages.)

The machine won't reset

- Go to the Guard Status screen. All of the E-Stops should be green.
- Inputs screen—Estop Relay Status and Guard Relay Status should be green.
- Open the electrical cabinet right door. OSSD1 and OSSD2 should be green - on Safety PLC.
- Get electrical drawings and verify the safety circuit using lights on Safety PLC
- A VFD communication bus fault may have occurred, and this will not register as an alarm on the HMI as the system is not communicating. When power is cycled to the machine the power must remain off for a minimum of 60 seconds to allow the drives capacitors to dissipate or this communications fault will occur. The fault can be identified by looking at the VFD LCD readout in the electrical enclosure. The LCD will read "bus". To clear this error power the machine off and wait 60 seconds to power on again.

Failure of main servo drive system

- Check the main servo amplifier for errors. When the system is enabled, it should display a dash on the amplifier.

The bed will not move to the home position

- Verify the system is enabled. The "System Enable" button on the home screen should be green.
- Check if the main drive chain is broken. It's located inside the operator's cabinet.
- Overtravel Proximity sensors functioning properly
- Ensure the load and unload arms are raised. They must be above the bed height for bed to move.

Installing a new main drive chain – two ways to reset bed at the home position

- With the chain off, on the HMI touch screen, press the home button and wait for the servo to move the sprocket into the home position. You can watch the sprocket on the servo motor to verify it is moving.
- Once the servo is homed, manually push the bed to the home located at the unload end.
- Hold off about 10mm away from the over travel proximity sensor towards the center of the machine.
- Once the bed is physically at the home position, install the new drive chain.

Or... with chain on and the bed out of home position

- Press jog on the HMI to move the bed towards the unload side until the bed is positioned 10mm away from the over travel proximity sensor toward the center of the machine.
- On the HMI, go to the engineering /configuration page. Reset the "Bed Zero Encoder" for the bed home position.

Machine loses home position - (goes into over travel)

- Chain the main drive chain tension. Either tighten or replace the chain.
- Check the gear racks for wear. (They tend to jump teeth before hitting the over travel proximity switch)
- Check the bed bearings for excessive play.
- Check the Ring Feder on the main drive sprocket for slipping. (Changes the relationship of the mechanics of the bed to the encoder on the bed servo motor. The encoder is where the position is derived)
- Try resetting the bed encoder's home position
- Check for gearbox or servo encoder faults (faults error visible on the amplifier drive screen or on the HMI alarm screen)

Load or unload table does not raise up

- Make sure the system is enabled.
- Check the actuator for the table upper limit switch to make sure it is not stuck?
- Check the pile height photosensor to see if it is blocked. If it's seeing something, the green LED will be lit. If it is seeing reflector, it will be green and orange
- Check the load VFD for any faults
- It could be a bad brake relay. Swap it with the opposite table brake relay to see if the problem follows the relay.
- Press the run button to see if the table will raise in the auto mode. It could be a bad switch.

Unload table drops too fast

- Try changing unload table down to a lower hertz. This setting is on the engineering / configuration page of the HMI touchscreen.
- Verify that the table brake is functioning properly.

Unload table raises then lowers by itself

- The unit reset button on the auto screen is flashing. Reset the unit count.
- Check Brake relay

Unload conveyor belt does not move

- Verify the HZ on the unload conveyor is not set to 0 or above 120. This setting is in the engineering pages on the HMI.
- Check VFD faults

Lead edge knife on the die rolled over (bent)

- The one-way clutch on the upper roll is not working properly
- The upper roll chain may have broken.
- There is too much cutting pressure
- Paper is getting packed in front of the knife.
- The upper roll brake pressure set too high (should be 15-20 psi)
- Add a cork or urethane pad to the lead corner of the die. (5/16" high to lessen the blow of the upper roll and the die during the cutting stage)

Front to back registration is not holding

- The main drive chain is loose. Either tension it or replace it.
- The load side place height may be too low. The sheet is being held by the cups as the bed starts to move. Raise the place height on the registration screen.
- Check the sheet for skew. The sheet may be dragging on something

ALARM VISUAL AID



The picture above is how the PLC (**Keyence**) will look when the machine is enabled and ready to run.

Section # 1

Input #5 e-stop circuit channel 1

Input #6 e-stop circuit channel 2

Input #7 and #8 chain guard panel sprag side

OSSD #1 is the E-Stop circuit.

OSSD #2 is the guard circuit.

Section #2

Input #1 and #2 Load window operator side

Input #3 and #4 Load window sprag side

Input #5 and #6 Load Door

Input #7 and #8 Unload window operator side

Input #9 and #10 Unload window sprag side

Input #11 and #12 Unload door

Input #13 and #14 Chain guard panel operator unload side.

Input #15 and #16 Chain guard panel operator load side

Section #3

Input #7 load door top limit Input #8 unload door top limit (lights will be on when door closed)

Input #9 and #10 Load Door bottom limit (lights will be off when the door is closed)

Input #11 and #12 Unload door bottom limit (lights will be off when the door is closed)

Input #13 and #14 Load door safety edge

Input #15 and #16 unload door safety edge

Flashing lights indicates an issue with that channel, and the rate of blinking will give a code for the error type.

ALARM CODES

If an error occurs in the servo drive, an alarm **A.000** or **CPF00** is displayed on the panel display.

Refer to the following table to identify the cause of an alarm and the action to be taken.

Alarm Number: Alarm Name	Cause	Investigative Actions	Corrective Actions
A.020: Parameter Checksum Error 1 (The parameter data in the SERVO PACK is incorrect.)	The power supply voltage suddenly dropped.	Measure the power supply voltage.	Set the power supply voltage within the specified range, and set Fn005 to initialize the parameter.
	The power supply went OFF while changing a parameter setting.	Check the circumstances when the power supply went OFF.	Set Fn005 to initialize the parameter and then set the parameter again.
	The number of times that parameters were written exceeded the limit.	Check to see if the parameters were frequently changed through the host controller.	The SERVO PACK may be faulty. Replace the SERVO PACK. Reconsider the method of writing parameters.
	Malfunction caused by noise from the AC power supply or grounding line, static electricity noise, etc.	Turn the power supply to the SERVO PACK OFF and ON again. If the alarm still occurs, the cause may be noise.	Take countermeasures against noise.
	Gas, water drops, or cutting oil entered the SERVO PACK and caused failure of the internal components.	Check the installation conditions.	The SERVO PACK may be faulty. Replace the SERVO PACK.
	A SERVO PACK fault occurred.	Turn the power supply to the SERVO PACK OFF and ON again. If the alarm still occurs, the SERVO PACK may be faulty.	The SERVO PACK may be faulty. Replace the SERVO PACK.
A.021: Parameter Format Error 1 (The parameter data in the SERVO PACK is incorrect.)	The software version of SERVO PACK that caused the alarm is older than that of the written parameter.	Check Fn012 to see if the set software version agrees with that of the SERVO PACK. If not, an alarm may occur.	Write the parameter of another SERVO PACK of the same model with the same software version. Then turn the power OFF and then ON again.
	A SERVO PACK fault occurred.		The SERVO PACK may be faulty. Replace the SERVO PACK.
A.022: System Checksum Error 1 (The parameter data in the SERVO PACK is incorrect.)	The power supply voltage suddenly dropped.	Measure the power supply voltage.	The SERVO PACK may be faulty. Replace the SERVO PACK.
	The power supply went OFF while setting an utility function.	Check the circumstances when the power supply went OFF.	The SERVO PACK may be faulty. Replace the SERVO PACK.
	A SERVO PACK fault occurred.	Turn the power supply to the SERVO PACK OFF and ON again. If the alarm still occurs, the SERVO PACK may be faulty.	The SERVO PACK may be faulty. Replace the SERVO PACK.
A.030: Main Circuit Detector Error	A SERVO PACK fault occurred.		The SERVO PACK may be faulty. Replace the SERVO PACK.
A.040: Parameter Setting Error 1 (The parameter setting was out of the setting range.)	The SERVO PACK and servomotor capacities do not match each other.	Check the combination of SERVO PACK and servomotor capacities.	Select the proper combination of SERVO PACK and servomotor capacities.
	A SERVO PACK fault occurred.		The SERVO PACK may be faulty. Replace the SERVO PACK.
	The parameter setting is out of the setting range.	Check the setting ranges of the parameters that have been changed.	Set the parameter to a value within the setting range.
	The electronic gear ratio is out of the setting range.	Check the electronic gear ratio. The ratio must satisfy: $0.001 < (Pn20E/Pn210) < 4000$.	Set the electronic gear ratio in the range: $0.001 < (Pn20E/Pn210) < 4000$.
A.041: Encoder Output Pulse Setting Error	The encoder output pulse (Pn212) is out of the setting range and does not satisfy the setting conditions.	Check the parameter Pn212.	Set Pn212 to a correct value.

Alarm Number: Alarm Name	Cause	Investigative Actions	Corrective Actions
A.042: Parameter Combination Error	The speed of program JOG operation (Fn004) is lower than the setting range after having changed the electronic gear ratio (Pn20E/Pn210) or the servomotor.	Check if the detection conditions are satisfied.	Decrease the setting of the electronic gear ratio (Pn20E/Pn210).
	The speed of program JOG operation (Fn004) is lower than the setting range after having changed the setting of the program JOG movement speed (Pn533).	Check if the detection conditions are satisfied.	Increase the setting of the program JOG movement speed (Pn533).
	The moving speed of advanced auto-tuning is lower than the setting range after having changed the electronic gear ratio (Pn20E/ Pn210) or the servomotor.	Check if the detection conditions are satisfied.	Decrease the setting of the electronic gear ratio (Pn20E/Pn210).
A.044: Semi-closed/Fully-closed Loop Control Parameter Setting Error	The setting of the fully-closed module does not match with that of Pn002.3.	Check the settings of Pn002.3.	The setting of fully-closed module must be compatible with the setting of Pn002.3.
A.04A: Parameter Setting Error 2	For a 4-byte parameter bank, no registration in two consecutive bytes for two bank members.		Change the number of bytes for bank members to an appropriate value.
	The total amount of bank data exceeds 64. (Pn900 x Pn901 > 64)		Reduce the total amount of bank data to 64 or less.
A.050: Combination Error (The SERVO PACK and servo- motor capacities do not correspond.)	The SERVO PACK and servomotor capacities do not match each other.	Check the capacities to see if they satisfy the following condition: Servomotor capacity SERVO PACK capacity	Select the proper combination of SERVO PACK and servomotor capacities.
	An encoder fault occurred.	Replace the servomotor and see if the alarm occurs again.	Replace the servomotor (encoder).
	A SERVO PACK fault occurred.		The SERVO PACK may be faulty. Replace the SERVO PACK.
A.051: Unsupported Device Alarm	An unsupported serial converter unit, encoder, or external encoder is connected to the SERVO PACK.	Check the product specifications, and select the correct model.	Select the correct combination of units.
A.OBO: Canceled Servo ON Command Alarm	After executing the utility function to turn ON the power to the motor, the servo ON command (SV ON) was sent from the host controller.		Turn the SERVO PACK power supply OFF and then ON again or execute a software reset.

Alarm Number: Alarm Name	Cause	Investigative Actions	Corrective Actions
A. 100: Overcurrent or Heat Sink Overheated (An overcurrent flowed through the IGBT or heat sink of SERVO PACK over-heated.)	Incorrect wiring or contact fault of main circuit cables.	Check the wiring. Refer to 3.1 Main Circuit Wiring for details.	Correct the wiring.
	Short-circuit or ground fault of main circuit cables.	Check for short-circuits across the servomotor terminal phases U, V, and W, or between the grounding and servomotor terminal phases U, V, or W. Refer to 3.1 Main Circuit Wiring for details.	The cable may be short-circuited. Replace the cable.
	Short-circuit or ground fault inside the servomotor.	Check for short-circuits across the servomotor terminal phases U, V, and W, or between the grounding and servomotor terminal phases U, V, or W. Refer to 3.1 Main Circuit Wiring for details.	The servomotor may be faulty. Replace the servomotor.
	Short-circuit or ground fault inside the SERVO PACK.	Check for short-circuits across the servomotor connection terminals U, V, and W on the SERVO PACK, or between the grounding and terminal U, V, or W. Refer to 3.1 Main Circuit Wiring for details.	The SERVO PACK may be faulty. Replace the SERVO PACK.
	Incorrect wiring or contact fault of the regenerative resistor.	Check the wiring. Refer to 3.7 Connecting Regenerative Resistors for details.	Correct the wiring.
	The dynamic brake (DB: Emergency stop executed from the SERVO PACK) was frequently activated, or the DB overload alarm occurred.	Check the power consumed by DB resistance (Un00B) to see how many times the DB has been used. Or, check the alarm history display Fn000 to see if the DB overload alarm A. 730 or A.731 was reported.	Change the SERVO PACK model, operating conditions, or the mechanism so that the DB does not need to be used so frequently.
	The generated regenerative resistor value exceeded the SERVO PACK regenerative energy processing capacity.	Check the regenerative load ratio (Un00A) to see how many times the regenerative resistor has been used.	Check the operating condition including overload, and reconsider the regenerative resistor value.
	The SERVO PACK regenerative resistance is too small.	Check the regenerative load ratio (Un00A) to see how many times the regenerative resistor has been used.	Change the regenerative resistance value to a value larger than the SERVO PACK minimum allowable resistance value.
	A heavy load was applied while the servomotor was stopped or running at a low speed.	Check to see if the operating conditions are outside servo drive specifications.	Reduce the load applied to the servomotor or increase the operating speed.
	Malfunction caused by noise interference.	Improve the wiring or installation environment, such as by reducing noise, and check to see if the alarm recurs.	Take countermeasures for noise, such as correct wiring of the FG. Use an FG wire size equivalent to the SERVO PACK main circuit wire size.
	A SERVO PACK fault occurred.		Turn the power supply to the SERVO PACK OFF and ON again. If the alarm still occurs, the SERVO PACK may be faulty. Replace the SERVO PACK.

Alarm Number: Alarm Name	Cause	Investigative Actions	Corrective Actions
A.300: Regeneration Error	The regenerative resistor capacity (Pn600) is set to a value other than 0 for a SGDVR70F, -R90F, -2R1F, -RTA, -R90A, -1 R6A, or -2R8A SERVO PACK, and an external regenerative resistor is not connected.	Check the external regenerative resistor connection and the value of the Pn600.	Connect the external regenerative resistor, or set Pn600 to 0 if no regenerative resistor is required.
	An external regenerative resistor is not connected to the SGDVR470A, -550A, -590A, -780A, 21 OD, -60D, -280D, or -370D SERVO PACK.	Check the connection of the external regenerative resistor or the Yaskawa regenerative resistor unit and the set value in Pn600.	Connect an external regenerative resistor and set Pn600 to the appropriate value, or connect a Yaskawa regenerative resistor unit and set Pn600 to 0.
	The jumper between the power supply terminals B2 and B3 has been removed for one of these SERVO Packs: SGDVR3R8A, -5R5A, -7R6A, -120A, -180A, -200A, -330A, -1R9D, -3R5D, -5R4D, -8R4D, -120D, and -170D.	Confirm that a jumper is mounted between the power supply terminals B2 and B3.	Correctly mount a jumper.
	The external regenerative resistor is incorrectly wired, or is removed or disconnected.	Check the external regenerative resistor connection.	Correctly connect the external regenerative resistor.
	A SERVO PACK fault occurred.		Turn the SERVO Pack's control power supply OFF and ON again while the main circuit power supply is OFF. If the alarm still occurs, the SERVO PACK may be faulty. Replace the SERVO PACK.
A.320: Regenerative Overload	The power supply voltage exceeds the specified limit.	Measure the power supply voltage.	Set the power supply voltage within the specified range.
	Insufficient external regenerative resistance, regenerative resistor capacity, or SERVO PACK capacity. Or, regenerative power has been continuously flowing back.	Check the operating condition or the capacity using the capacity selection Software SigmaJunmaSize+, etc.	Change the regenerative resistance, regenerative resistor capacity, or SERVO PACK capacity. Reconsider the operating conditions using the capacity selection software SigmaJunmaSize+, etc.
	Regenerative power continuously flowed back because negative load was continuously applied.	Check the load applied to the servomotor during operation.	Reconsider the system including servo, machine, and operating conditions.
	The setting of parameter Pn600 is smaller than the external regenerative resistor's capacity.	Check the external regenerative resistor connection and the value of the Pn600.	Set the Pn600 to a correct value.
	The external regenerative resistance is too high.	Check the regenerative resistance.	Change the regenerative resistance to a correct value or use an external regenerative resistor of appropriate capacity.
	A SERVO PACK fault occurred.		The SERVO PACK may be faulty. Replace the SERVO PACK.

Alarm Number: Alarm Name	Cause	Investigative Actions	Corrective Actions
A.330: Main Circuit Power Supply Wiring Error (Detected when the main circuit power supply is turned ON.)	The regenerative resistor disconnected when the SERVO PACK power supply voltage was high.	Measure the resistance of the regenerative resistor using a measuring instrument.	When using a regenerative resistor built in the SERVO PACK: - Replace the SERVO PACK. When using an external regenerative resistor: - Replace the external regenerative resistor.
	In the AC power input mode, DC power was supplied.	Check the power supply to see if it is a DC power supply.	Correct the settings to match the actual power supply specifications.
	In the DC power input mode, AC power was supplied.	Check the power supply to see if it is an AC power supply.	Correct the settings to match the actual power supply specifications.
	The regenerative resistor capacity (Pn600) is set to a value other than O for a SGD V-R70F, -R90F, -2R1F, -R70A, -R90A, -IR6A, or -2R8A SERVO PACK, and an external regenerative resistor is not connected.	Check the external regenerative resistor connection and the value of the Pn600.	Connect the external regenerative resistor, or set Pn600 to 0 if no external regenerative resistor is required.
	An external regenerative resistor is not connected to the SGD V -470A, -550A, -590A, -780A, 21 OD, -260D, -280D, or -370D SERVO PACK.	Check the connection of the external regenerative resistor or the Yaskawa regenerative resistor unit and the set value in Pn600.	Connect an external regenerative resistor and set Pn600 to the appropriate value, or connect a Yaskawa regenerative resistor unit and set Pn600 to 0.
	The jumper between the power supply terminals B2 and B3 has been removed for one of these SERVO Packs: SGD V-3R8A, -5R5A, -7R6A, -120A, -180A, -200A, -330A, -IR9D, -3R5D, -5R4D, -8R4D, -120D, and -170D.	Confirm that a jumper is mounted between the power supply terminals B2 and B3.	Correctly mount a jumper.
	A SERVO PACK fault occurred.		The SERVO PACK may be faulty. Replace the SERVO PACK.

Alarm Number: Alarm Name	Cause	Investigative Actions	Corrective Actions
A.400: Overvoltage (Detected in the SERVO PACK main circuit power supply section.)	For 100-VAC SERVO Packs: The AC power supply voltage exceeded 145 V. For 200-VAC SERVO Packs: The AC power supply voltage exceeded 290 V. For 400-VAC SERVO Packs: The AC power supply voltage exceeded 580 V. For 200-VAC SERVO Packs: with DC power supply input: The DC power supply voltage exceeded 410 V. For 400-VAC SERVO Packs: The DC power supply voltage exceeded 820 V.	Measure the power supply voltage.	Set AC/DC power supply voltage within the specified range.
	The power supply is unstable, or was influenced by a lightning surge.	Measure the power supply voltage.	Improve the power supply conditions, e.g., by installing a surge absorber. Then, turn the SERVO PACK power supply OFF and ON again. If the alarm still occurs, the SERVO PACK may be faulty. Replace the SERVO PACK.
	Voltage for AC power supply was too high during acceleration or deceleration.	Check the power supply voltage and the speed and torque during operation.	Set AC power supply voltage within the specified range.
	The external regenerative resistance is too high for the actual operating conditions.	Check the operating conditions and the regenerative resistance.	Select a regenerative resistance value appropriate for the operating conditions and load.
	The moment of inertia ratio exceeded the allowable value.	Confirm that the moment of inertia ratio is within the allowable range.	Increase the deceleration time, or reduce the load.
	A SERVO PACK fault occurred.		Turn the SERVO Pack's control power supply OFF and ON again while the main circuit power supply is OFF. If the alarm still occurs, the SERVO PACK may be faulty. Replace the SERVO PACK.
A.410: Undervoltage (Detected in the SERVO PACK main circuit power supply section.)	For 100-VAC SERVO Packs: The AC power supply voltage is 49 V or less. For 200-VAC SERVO Packs: The AC power supply voltage is 120 V or less. For 400-VAC SERVO Packs: The AC power supply voltage is 240 V or less.	Measure the power supply voltage.	Set the power supply voltage within the specified range.
	The power supply voltage dropped during operation.	Measure the power supply voltage.	Increase the power supply capacity.
	Occurrence of instantaneous power interruption.	Measure the power supply voltage.	When the instantaneous power cut hold time (Pn509) is set, decrease the setting.
	The SERVO PACK fuse is blown out.		Replace the SERVO PACK, connect a reactor, and run the SERVO PACK.
	A SERVO PACK fault occurred.		The SERVO PACK may be faulty. Replace the SERVO PACK.
A.450: Main-Circuit Capacitor Over-voltage	A SERVO PACK fault occurred.		Replace the SERVO PACK.

Alarm Number: Alarm Name	Cause	Investigative Actions	Corrective Actions
A.510: Overspeed (The servomotor speed exceeds the maximum.)	The order of phases U, V, and W in the servomotor wiring is incorrect.	Check the motor wiring.	Confirm that the servomotor is correctly wired.
	A reference value exceeding the overspeed detection level was input.	Check the input value.	Reduce the reference value or adjust the gain.
	The motor speed exceeded the maximum.	Check the motor speed waveform.	Reduce the speed reference input gain, adjust the servo gain, or reconsider the operating conditions.
	A SERVO PACK fault occurred.		The SERVO PACK may be faulty. Replace the SERVO PACK.
A.511: Overspeed of Encoder Output Pulse Rate	The encoder output pulse frequency exceeded the limit.	Check the encoder output pulse setting.	Decrease the setting of the encoder output pulse (Pn212).
	The encoder output pulse output frequency exceeded the limit because the motor speed was too high.	Check the encoder output pulse output setting and motor speed.	Decrease the motor speed.
A. 520: Vibration Alarm	Abnormal vibration was detected at the motor speed.	Check for abnormal noise from the servomotor, and check the speed and torque waveforms during operation.	Reduce the motor speed or reduce the speed loop gain (Pn100).
	The moment of inertia ratio (Pn103) value is greater than the actual value or is greatly changed.	Check the moment of inertia ratio.	Set the moment of inertia ratio (Pn103) to an appropriate value.
A.521 : Autotuning Alarm (Vibration was detected while executing the one parameter tuning, EasyFFT, or tuning-less function.)	The servomotor vibrated considerably while performing tuning-less function.	Check the motor speed waveform.	Reduce the load so that the moment of inertia ratio falls within the allowable value, or raise the load level using the tuning-less levels setting (Fn200) or reduce the rigidity level.
	The servomotor vibrated considerably during one-parameter tuning or EasyFFT.	Check the motor speed waveform.	Check the operation procedure of corresponding function and take a corrective action.
A.710: Overload (High Load) A.720: Overload (Low Load)	Incorrect wiring or contact fault of servomotor and encoder.	Check the wiring.	Confirm that the servomotor and encoder are correctly wired.
	Operation beyond the overload protection characteristics.	Check the servomotor overload characteristics and executed run command.	Reconsider the load conditions and operating conditions. Or, increase the motor capacity.
	Excessive load was applied during operation because the servomotor was not driven due to mechanical problems.	Check the executed operation reference and motor speed.	Remove the mechanical problems.
	A SERVO PACK fault occurred.		The SERVO PACK may be faulty. Replace the SERVO PACK.
A.730: A.731: Dynamic Brake Overload (An excessive power consumption of dynamic brake was detected.)	The servomotor rotates because of external force.	Check the operation status.	Take measures to ensure the servomotor will not rotate because of external force.
	The rotating energy at a DB stop exceeds the DB resistance capacity.	Check the power consumed by DB resistance (Un00B) to see how many times the DB has been used.	Reconsider the following: Reduce the motor reference speed. Reduce the moment of inertia ratio. Reduce the number of times of the DB stop operation.
	A SERVO PACK fault occurred.		The SERVO PACK may be faulty. Replace the SERVO PACK.

Alarm Number: Alarm Name	Cause	Investigative Actions	Corrective Actions
A.740: Overload of Surge Current Limit Resistor (The main circuit power is turned ON/ OFF too frequently.)	The inrush current limit resistor operation frequency at the main circuit power supply ON/OFF opera- tion exceeds the allowable range.		Reduce the frequency of turning the main circuit power supply ON/OFF.
	A SERVO PACK fault occurred.		The SERVO PACK may be faulty. Replace the SERVO PACK.
A.7A0: Heat Sink Overheated (Detected when the heat sink temperature exceeds 100°C.)	The surrounding air temperature is too high.	Check the surrounding air temperature using a thermostat.	Decrease the surrounding air temperature by improving the SERVO PACK installation conditions.
	The overload alarm has been reset by turning OFF the power too many times.	Check the alarm history display (Fn000) to see if the overload alarm was reported.	Change the method for resetting the alarm.
	Excessive load or operation beyond the regenerative energy processing capacity.	Check the accumulated load ratio (Un009) to see the load during operation, and the regenerative load ratio (Un00A) to see the regenerative energy processing capacity.	Reconsider the load and operating conditions.
	Incorrect SERVO PACK installation orientation or/and insufficient space around the SERVO PACK.	Check the SERVO PACK installation condi- tions.	Install the SERVO PACK correctly as speci- fied.
	A SERVO PACK fault occurred.		The SERVO PACK may be faulty. Replace the SERVO PACK.
A.7Ab: Built-in Fan in SERVO PACK Stopped	The fan inside the SERVO PACK stopped.	Check for foreign matter or debris inside the SERVO PACK.	Remove foreign matter or debris from the SERVO PACK. If the alarm still oc- curs, the SERVO PACK may be faulty. Replace the SERVO PACK.
A.810: Encoder Backup Error (Only when an absolute encoder is connected.) (Detected on the en- coder side.)	Alarm occurred when the power to the absolute encoder was initially turned ON.	Check to see if the power was turned ON initially.	Set up the encoder (Fn008).
	The encoder cable disconnected, and connected again.	Check to see if the power was turned ON initially.	Confirm the connection and set up the encoder (Fn008).
	The power from both the control power supply (+5 V) from the SERVO PACK and the battery power supply is not being supplied.	Check the encoder connector battery or the connector contact status.	Replace the battery or take similar measures to supply power to the en- coder, and set up the encoder (Fn008).
	An absolute encoder fault occurred.		If the alarm cannot be reset by setting up the encoder again, replace the servomotor.
	A SERVO PACK fault occurred.		The SERVO PACK may be faulty. Replace the SERVO PACK.
A.820: Encoder Checksum Error (Detected on the encoder side.)	An encoder fault occurred.		Absolute encoder: - Set up the encoder again using Fn008. If the alarm still occurs, the servomotor may be faulty. Replace the servomotor. Single-turn absolute encoder or incre- mental encoder: - The servomotor may be faulty. Replace the servomotor.
	A SERVO PACK fault occurred.		The SERVO PACK may be faulty. Replace the SERVO PACK

Alarm Number: Alarm Name	Cause	Investigative Actions	Corrective Actions
A.830: Absolute Encoder Battery Error (The absolute encoder battery voltage is lower than the specified value.)	The battery connection is incorrect.	Check the battery connection.	Reconnect the battery.
	The battery voltage is lower than the specified value 2.7 V.	Measure the battery voltage.	Replace the battery.
	A SERVO PACK fault occurred.		The SERVO PACK may be faulty. Replace the SERVO PACK.
A.840: Encoder Data Error (Detected on the encod- er side.)	An encoder malfunctioned.		Turn the power supply to the SERVO PACK OFF and ON again. If the alarm still occurs, the servomotor may be faulty. Replace the servomotor.
	Malfunction of encoder because of noise interference, etc.		Correct the wiring around the encoder by separating the encoder cable from the servomotor main circuit cable or by check- ing the grounding and other wiring.
A.850: Encoder Overspeed (Detected when the control power supply was turned ON.) (Detected on the encod- er side.)	The servomotor speed is higher than 200 min- when the control power supply was turned ON.	Check the motor rotating speed (Un000) to confirm the servomotor speed when the power is turned ON.	Reduce the servomotor speed to a value less than 200 min ⁻¹ , and turn ON the con- trol power supply.
	An encoder fault occurred.		Turn the power supply to the SERVO PACK OFF and ON again. If the alarm still occurs, the servomotor may be faulty. Replace the servomotor.
	A SERVO PACK fault occurred.		Turn the power supply to the SERVO PACK OFF and ON again. If the alarm still occurs, the SERVO PACK may be faulty. Replace the SERVO PACK.
A.860: Encoder Overheated (Only when an absolute encoder is connected.) (Detected on the en- coder side.)	The ambient operating temperature around the servomotor is too high.	Measure the ambient operating temperature around the servomotor.	Reduce the ambient operating tempera- ture of the servomotor to 40°C or less.
	The motor load is greater than the rated load.	Check the accumulated load ratio (Un009) to see the load.	Operate the SERVO PACK so that the motor load remains within the specified range.
	An encoder fault occurred.		Turn the power supply to the SERVO PACK OFF and ON again. If the alarm still occurs, the servomotor may be faulty. Replace the servomotor.
	A SERVO PACK fault occurred.		Turn the power supply to the SERVO PACK OFF and ON again. If the alarm still occurs, the SERVO PACK may be faulty. Replace the SERVO PACK.
A.8A0: External Encoder Error	Setting the zero point position of external absolute encoder failed be- cause the servomotor rotated.	Before setting the zero point position, use the fully-closed feedback pulse coun- ter (Un00E) to confirm that the servomo- tor is not rotating.	The servomotor must be stopped while setting the zero point position.
	An external encoder fault occurred.		Replace the external encoder.
A.8A1 : External Encoder Error of Module	An external encoder fault occurred.		Replace the external encoder.
	A serial converter unit fault occurred.		Replace the serial converter unit.
A.8A2: External Encoder Error of Sensor (Incremental)	An external encoder fault occurred.		Replace the external encoder.

Alarm Number: Alarm Name	Cause	Investigative Actions	Corrective Actions
A.8A3: External Encoder Error of Position (Absolute)	An external absolute encoder fault occurred.		The external absolute encoder may be faulty. Refer to the encoder manufacturer's instruction manual for corrective actions.
A.8A5: External Encoder Overspeed	The overspeed from the external encoder occurred.	Check the maximum speed of the external encoder.	Keep the external encoder below its maximum speed.
A.8A6: External Encoder Overheated	The overheat from the external encoder occurred.		Replace the external encoder.
A.b31: Current Detection Error 1	The current detection circuit for phase U is faulty.		Turn the power supply to the SERVO PACK OFF and ON again. If the alarm still occurs, the SERVO PACK may be faulty. Replace the SERVO PACK.
A.b32: Current Detection Error 2	The current detection circuit for phase V is faulty.		Turn the power supply to the SERVO PACK OFF and ON again. If the alarm still occurs, the SERVO PACK may be faulty. Replace the SERVO PACK.
A.b33: Current Detection Error 3	The detection circuit for the current is faulty.		Turn the power supply to the SERVO PACK OFF and ON again. If the alarm still occurs, the SERVO PACK may be faulty. Replace the SERVO PACK.
	The servomotor main circuit cable is disconnected.	Check for disconnection of the servomotor main circuit cable.	Correct the servomotor wiring.
A.b6A: MECHATROLINK Communications ASIC Error 1	SERVO PACK MECHATROLINK communication section fault.		Turn the power supply to the SERVO PACK OFF and ON again. If the alarm still occurs, the SERVO PACK may be faulty. Replace the SERVO PACK.
A.b6b: MECHATROLINK Communications ASIC Error 2	MECHATROLINK data reception error occurred due to noise interference.		Take measures against noise. Check the MECHATROLINK communications cable and FG wiring and take measures such as adding ferrite core on the MECHATROLINK communications cable.
	SERVO PACK MECHATROLINK communication section fault.		Turn the power supply to the SERVO PACK OFF and ON again. If the alarm still occurs, the SERVO PACK may be faulty. Replace the SERVO PACK.
A.bE0: Firmware Error	A SERVO PACK fault occurred.		Turn the power supply OFF and then ON again. If the alarm still occurs, the SERVO PACK may be faulty. Replace the SERVO PACK.
A.bF0: System Alarm 0	A SERVO PACK fault occurred.		Turn the power supply to the SERVO PACK OFF and ON again. If the alarm still occurs, the SERVO PACK may be faulty. Replace the SERVO PACK.
A.bF1: System Alarm 1	A SERVO PACK fault occurred.		Turn the power supply to the SERVO PACK OFF and ON again. If the alarm still occurs, the SERVO PACK may be faulty. Replace the SERVO PACK.

Alarm Number: Alarm Name	Cause	Investigative Actions	Corrective Actions
A.bF2: System Alarm 2	A SERVO PACK fault occurred.		Turn the power supply to the SERVO PACK OFF and ON again. If the alarm still occurs, the SERVO PACK may be faulty. Replace the SERVO PACK.
A.bF3: System Alarm 3	A SERVO PACK fault occurred.		Turn the power supply to the SERVO PACK OFF and ON again. If the alarm still occurs, the SERVO PACK may be faulty. Replace the SERVO PACK.
System Alarm 4	A SERVO PACK fault occurred.		Turn the power supply to the SERVO PACK OFF and ON again. If the alarm still occurs, the SERVO PACK may be faulty. Replace the SERVO PACK.
A.C10: Servo Overrun Detected (Detected when the servomotor power is ON.)	The order of phases U, V, and W in the servomotor wiring is incorrect.	Check the motor wiring.	Confirm that the servomotor is correctly wired.
	An encoder fault occurred.		If the alarm still occurs after turning the power OFF and then ON again, even though the servomotor is correctly wired, the servomotor may be faulty. Replace the servomotor.
	A SERVO PACK fault occurred.		Turn the power supply to the SERVO PACK OFF and ON again. If the still occurs, the SERVO PACK may be faulty. Replace the SERVO PACK.
A.C80: Absolute Encoder Clear Error and Multi-turn Limit Setting Error	An encoder fault occurred.		Turn the power supply to the SERVO PACK OFF and ON again. If the alarm still occurs, the servomotor may be faulty. Replace the servomotor.
	A SERVO PACK fault occurred.		Turn the power supply to the SERVO PACK OFF and ON again. If the alarm still occurs, the SERVO PACK may be faulty. Replace the SERVO PACK.
A.C90: Encoder Communications Error	Contact fault of connector or incorrect wiring for encoder cable.	Check the connector contact status for encoder cable.	Re-insert the connector and confirm that the encoder is correctly wired.
	Cable disconnection for encoder cable or short-circuit. Or, incorrect cable impedance.	Check the encoder cable.	Use the cable with the specified rating.
	Corrosion caused by improper temperature, humidity, or gas, short-circuit caused by intrusion of water drops or cutting oil, or connector contact fault caused by vibration.	Check the operating environment.	Improve the operating environmental conditions, and replace the cable. If the alarm still occurs, replace the SERVO PACK.
	Malfunction caused by noise interference.		Correct the wiring around the encoder by separating the encoder cable from the servomotor main circuit cable or by checking the grounding and other wiring.
	A SERVO PACK fault occurred.		Connect the servomotor to another SERVO PACK, and turn ON the control power. If no alarm occurs, the SERVO PACK may be faulty. Replace the SERVO PACK.

Alarm Number: Alarm Name	Cause	Investigative Actions	Corrective Actions
A.C91: Encoder Communications Position Data Error	Noise interference occurred on the I/O signal line because the encoder cable is bent and the sheath is damaged.	Check the encoder cable and connector.	Confirm that there is no problem with the cable layout.
	The encoder cable is bundled with a high-current line or near a high-current line.	Check the cable layout for encoder cable.	Confirm that there is no surge voltage on the cable.
	The FG potential varies because of influence from machines on the servomotor side, such as the welder.	Check the cable layout for encoder cable.	Properly ground the machines to separate from the encoder FG.
A.C92: Encoder Communications Timer Error	Noise interference occurred on the I/O signal line from the encoder.		Take countermeasures against noise for the encoder wiring.
	Excessive vibration and shocks were applied to the encoder.	Check the operating environment.	Reduce the machine vibration or correctly install the servomotor.
	An encoder fault occurred.		Turn the power supply to the SERVO PACK OFF and ON again. If the alarm still occurs, the servomotor may be faulty. Replace the servomotor.
	A SERVO PACK fault occurred.		Turn the power supply to the SERVO PACK OFF and ON again. If the alarm still occurs, the SERVO PACK may be faulty. Replace the SERVO PACK.
A.CA0: Encoder Parameter Error	An encoder fault occurred.		Turn the power supply to the SERVO PACK OFF and ON again. If the alarm still occurs, the servomotor may be faulty. Replace the servomotor.
	A SERVO PACK fault occurred.		Turn the power supply to the SERVO PACK OFF and ON again. If the alarm still occurs, the SERVO PACK may be faulty. Replace the SERVO PACK.

Alarm Number: Alarm Name	Cause	Investigative Actions	Corrective Actions
A.Cb0: Encoder Echo back Error	The wiring and contact for encoder cable are incorrect.	Check the wiring.	Correct the wiring.
	Noise interference occurred due to incorrect cable specifications of encoder cable.		Use tinned annealed copper shielded twisted-pair or screened unshielded twisted-pair cable with a core of at least 0.12 mm ²
	Noise interference occurred because the wiring distance for the encoder cable is too long.		The wiring distance must be 50 m max.
	The FG potential varies because of influence from machines on the servomotor side, such as the welder.	Check the cable layout for encoder cable.	Properly ground the machines to separate from encoder FG
	Excessive vibration and shocks were applied to the encoder.	Check the operating environment.	Reduce the machine vibration or correctly install the servomotor.
	An encoder fault occurred.		Turn the power supply to the SERVO PACK OFF and ON again. If the alarm still occurs, the servomotor may be faulty. Replace the servomotor.
	A SERVO PACK fault occurred.		Turn the power supply to the SERVO PACK OFF and ON again. If the alarm still occurs, the SERVO PACK may be faulty. Replace the SERVO PACK.
A.CC0: Multiturn Limit Disagreement	When using a direct drive (DD) servomotor, the multiturn limit value (Pn205) is different from that of the encoder.	Check the value of the Pn205.	Correct the setting of Pn205 (0 to 65535).
	The multiturn limit value of the encoder is different from that of the SERVO PACK. or, the multiturn limit value of the SERVO PACK has been changed.	Check the value of the Pn205 of the SERVO PACK.	Execute Fn013 at the occurrence of alarm.
	A SERVO PACK fault occurred.		Turn the power supply to the SERVO PACK OFF and ON again. If the alarm still occurs, the SERVO PACK may be faulty. Replace the SERVO PACK.
A.CF1: Feedback Option Module Communications Error (Reception error)	Wiring of cable between serial converter unit and SERVO PACK is incorrect or contact is faulty.	Check the external encoder wiring.	Correct the cable wiring.
	The specified cable is not used between serial converter unit and SERVO PACK.	Confirm the external encoder wiring specifications.	Use the specified cable.
	Cable between serial converter unit and SERVO PACK is too long.	Measure the length of this cable.	Use 20 m cable max.
	Sheath of cable between serial converter unit and SERVO PACK is broken.	Check the cable for damage.	Replace the cable.
A.CF2: Feedback Option Module Communications Error (Timer stop)	Noise interferes with the cable between serial converter unit and SERVO PACK.		Correct the wiring around serial converter unit, e.g., separating I/O signal line from main circuit cable or grounding.
	A serial converter unit fault occurred.		Replace the serial converter unit.
	A SERVO PACK fault occurred.		Replace the SERVO PACK.

Alarm Number: Alarm Name	Cause	Investigative Actions	Corrective Actions
A.d00: Position Error Overflow (Position error exceeded the value set in the excessive position error alarm level (Pn520).)	The servomotor U, V, and W wirings is faulty.	Check the servomotor main circuit cable connection.	Confirm that there is no contact fault in the motor wiring or encoder wiring.
	The position reference speed is too high.	Reduce the reference speed, and operate the SERVO PACK.	Reduce the position reference speed or acceleration of position reference. Or reconsider the electronic gear ratio.
	The acceleration of the position reference is too high.	Reduce the reference acceleration, and operate the SERVO PACK.	Reduce the reference acceleration of the position reference using a MECHATROLINK command, or smooth the acceleration of the position reference by selecting the position reference filter (ACCFIL) using a MECHATROLINK command.
	Setting of the excessive position error alarm level (Pn520) is low against the operating condition.	Check the alarm level (Pn520) to see if it is set to an appropriate value.	Set the Pn520 to proper value.
	A SERVO PACK fault occurred.		Turn the power supply to the SERVO PACK OFF and ON again. If the alarm still occurs, the SERVO PACK may be faulty. Replace the SERVO PACK.
A.d01: Position Error Overflow Alarm at Servo ON	This alarm occurs If the servomotor power is turned ON when the position error is greater than the set value of Pn526 while the servomotor power is OFF.	Check the position error amount (Un008) while the servomotor power is OFF.	Correct the excessive position error alarm level at servo ON (Pn526).
A.d02: Position Error Overflow Alarm by Speed Limit at Servo ON	When the position errors remain in the error counter, Pn529 limits the speed if the servomotor power is ON. If Pn529 limits the speed in such a state, this alarm occurs when position references are input and the number of position errors exceeds the value set for the excessive position error alarm level (Pn520).		Correct the excessive position error alarm level (Pn520). Or, adjust the speed limit level at servo ON (Pn529).
A.d10: Motor-load Position Error Overflow	Motor rotation direction and external encoder installation direction are opposite.	Check the servomotor rotation direction and the external encoder installation direction.	Install the external encoder in the opposite direction, or change the setting of the external encoder usage method (Pn002.3) to reverse the direction.
	Mounting of the load (e.g., stage) and external encoder joint installation are incorrect.	Check the external encoder mechanical connection.	Check the mechanical joints.
A.E02: MECHATROLINK Internal Synchronization Error 1	MECHATROLINK transmission cycle fluctuated.		Remove the cause of transmission cycle fluctuation at host controller.
	A SERVO PACK fault occurred.		Turn the power supply to the SERVO PACK OFF and ON again. If the alarm still occurs, the SERVO PACK may be faulty. Replace the SERVO PACK.
A.E40: MECHATROLINK Transmission Cycle Setting Error	Setting of MECHATROLINK transmission cycle is out of specifications range.	Check the MECHATROLINK transmission cycle setting.	Set the transmission cycle to the proper value.

Alarm Number: Alarm Name	Cause	Investigative Actions	Corrective Actions
A.E50: MECHATROLINK Synchronization Error	WDT data of host controller was not updated correctly.	Check the WDT data updating for the host controller.	Update the WDT data at the host controller correctly.
	A SERVO PACK fault occurred.		Turn the power supply to the SERVO PACK OFF and ON again. If the alarm still occurs, the SERVO PACK may be faulty. Replace the SERVO PACK.
A.E51: MECHATROLINK Synchronization Failed	WDT data of host controller was not updated correctly at the synchronization communications start, and synchronization communications could not start.	Check the WDT data updating for the host controller.	Update the WDT data at the host controller correctly.
	A SERVO PACK fault occurred.		Turn the power supply to the SERVO PACK OFF and ON again. If the still occurs, the SERVO PACK may be faulty. Replace the SERVO PACK.
A.E60: MECHATROLINK Communications error (Reception error)	MECHATROLINK wiring is incorrect.	Check the MECHATROLINK wirings.	Correct the MECHATROLINK wiring. Connect the terminator correctly.
	MECHATROLINK data reception error occurred due to noise interference.		Take measures against noise. Check the MECHATROLINK communications cable and FG wiring and take measures such as adding ferrite core on the MECHATROLINK communications cable.
	A SERVO PACK fault occurred.		Turn the power supply to the SERVO PACK OFF and ON again. If the alarm still occurs, the SERVO PACK may be faulty. Replace the SERVO PACK.
A.E61: MECHATROLINK Transmission Cycle Error (Synchronization interval error)	MECHATROLINK transmission cycle fluctuated.	Check the MECHATROLINK transmission cycle setting.	Remove the cause of transmission cycle fluctuation at host controller.
	A SERVO PACK fault occurred.		Turn the power supply to the SERVO PACK OFF and ON again. If the alarm still occurs, the SERVO PACK may be faulty. Replace the SERVO PACK.
A.E71: Safety Option Module Detection Failure	The connection between the SERVO PACK and the safety option module is faulty.	Check the connection between the SERVO PACK and the safety option module.	Correctly connect the safety option module.
	The safety option module was disconnected.		Execute Fn014 (Resetting configuration error in option module) from the digital operator or SigmaWin+, and then turn the power supply OFF and ON again.
	A safety option module fault occurred.		Replace the safety option module.
	A SERVO PACK fault occurred.		Replace the SERVO PACK.
A.E72: Feedback Option Module Detection Failure	The connection between the SERVO PACK and the Feedback Option Module is Faulty.	Check the connection between the SERVO PACK and the Feedback Option Module.	Correctly connect the Feedback Option Module.
	The Feedback Option Module was disconnected.		Execute Fn014 (Resetting configuration error in option module), and then turn the power supply OFF and ON again.
	A Feedback Option Module fault occurred.		Replace the Feedback Option Module.
	A SERVO PACK fault occurred.		Replace the SERVO PACK.

Alarm Number: Alarm Name	Cause	Investigative Actions	Corrective Actions
A.E74: Unsupported Safety Option Module	A safety option module fault occurred.		Replace the safety option module.
	A unsupported safety option module was connected.	Refer to the catalog of the connected safety option module.	Connect a compatible safety option module.
A.E75: Unsupported Feedback Option Module	A feedback option module fault occurred.		Replace the feedback option module.
	A unsupported feedback option module was connected.	Refer to the catalog of the connected feedback option module or the manual of the SERVO PACK.	Connect a compatible feedback option module.
A.EA2: DRV Alarm 2 (SERVO PACK WDT error)	MECHATROLINK transmission cycle fluctuated.	Check the MECHATROLINK transmission cycle setting.	Remove the cause of transmission cycle fluctuation at host controller.
	A SERVO PACK fault occurred.		Turn the power supply to the SERVO PACK OFF and ON again. If the alarm still occurs, the SERVO PACK may be faulty. Replace the SERVO PACK.
A.Eb1: Safety Function Signal Input Timing Error	The lag between activations of the input signals /HWBBI and /HWBB2 for the I-IWBB function is ten second or more.	Measure the time lag between the /HWBBI and /HWBB2 signals.	The output signal circuits or devices for /HWBBI and /HWBB2 or the SERVO PACK input signal circuits may be faulty. Alternatively, the input signal cables may be disconnected. Check if any of these items are faulty or have been disconnected.
A.Ed1: Command Execution Timeout	A timeout error occurred when using an MECHATROLINK command.	Check the motor status when the command is executed.	Execute the SV_ON or SENS_ON command only when the motor is not running.
		For fully-closed loop control, check the status of the external encoder after an output is made to execute the command.	Execute the SENS_ON command only when an external encoder is connected.
A.F10: Main Circuit Cable Open Phase (A low voltage continued for one second or longer in either phase R, S, or T when the main circuit power supply was ON.) (Detected when the main circuit power supply is turned ON.)	The three-phase power supply wiring is incorrect.	Check the power supply wiring.	Confirm that the power supply is correctly wired.
	The three-phase power supply is unbalanced.	Measure the voltage at each phase of the three-phase power supply.	Balance the power supply by changing phases.
	A single-phase power is input without setting Pn00B.2 (power supply method for three-phase SERVO PACK) to 1 (single-phase power supply).	Check the power supply and the parameter setting.	Match the parameter setting to the power supply.
	A SERVO PACK fault occurred.		Turn the power supply to the SERVO PACK OFF and ON again. If the alarm still occurs, the SERVO PACK may be faulty. Replace the SERVO PACK.
A.F50: Servomotor Main Circuit Cable Disconnection (The servomotor did not operate or power was not supplied to the servomotor even though the SV_ON (Servo ON) command was input when the servomotor was ready to receive it.)	A SERVO PACK fault occurred.		The SERVO PACK may be faulty. Replace the SERVO PACK.
	The wiring is not correct or there is a faulty contact in the motor wiring.	Check the wiring.	Make sure that the servomotor is correctly wired.

Alarm Number: Alarm Name	Cause	Investigative Actions	Corrective Actions
FL-1 *3: System Alarm	SERVO PACK failure		Turn the power supply to the SERVO PACK OFF and ON again. If the alarm still occurs, the SERVO PACK may be faulty. Replace the SERVO PACK.
FL-2 *3: System Alarm			
CPF00: Digital Operator Transmission Error 1	The contact between the digital operator and the SERVO PACK is faulty.	Check the connector contact.	Insert securely the connector or replace the cable.
	Malfunction caused by noise interference.		Keep the digital operator or the cable away from noise sources.
CPF01: Digital Operator Transmission Error 2	A digital operator fault occurred.		Disconnect the digital operator and then re-connect it. If the alarm still occurs, the digital operator may be faulty. Replace the digital operator.
	A SERVO PACK fault occurred.		Turn the power supply to the SERVO PACK OFF and ON again. If the alarm still occurs, the SERVO PACK may be faulty. Replace the SERVO PACK.

*3. These alarms are not stored in the alarm history and are displayed only in the panel display

Warning Number	Warning Name	Meaning
A.900 ^{*1}	Position Error Overflow	Position error exceeded the parameter setting (Pn520xPn51E/100).
A.901 ^{*1}	Position Error Overflow Alarm at Servo ON	When the servomotor power is ON, the position error exceeded the parameter setting (Pn526xPn528/100).
A.910	Overload	This warning occurs before the overload alarms (A.710 or A.720) occur. If the warning is ignored and operation continues, an overload alarm may occur.
A.911	Vibration	Abnormal vibration at the motor speed was detected. The detection level is the same as A.520. Set whether to output an alarm or warning by the vibration detection switch (Pn310).
A.920 ^{*1}	Regenerative Overload	This warning occurs before the regenerative overload alarm (A.320) occurs. If the warning is ignored and operation continues, a regenerative overload alarm may occur.
A.921 ^{*1}	Dynamic Brake Overload	This warning occurs before dynamic brake overload alarm (A.731) occurs. If the warning is ignored and operation continues, a dynamic brake overload alarm may occur.
A.930 ^{*1}	Absolute Encoder Battery Error	This warning occurs when the voltage of absolute encoder's battery is lowered.
A.94A ^{*2}	Data Setting Warning 1 (Parameter Number Error)	Incorrect command parameter number was set.
A.94B ^{*2}	Data Setting Warning 2 (Out of Range)	Command input data is out of range.
A.94C ^{*2}	Data Setting Warning 3 (Calculation Error)	Calculation error was detected.
A.94D ^{*2}	Data Setting Warning 4 (Parameter Size)	Data size does not match.
A.94E ^{*2}	Data Setting Warning 5 (Latch Mode Error)	Latch mode error is detected.
A.95A ^{*2}	Command Warning 1 (Unsatisfying Command)	Command was sent although the conditions for sending a command were not satisfied.
A.95B ^{*2}	Command Warning 2 (Non-supported Command)	Unsupported command was sent.
A.95D ^{*2}	Command Warning 4 (Command Interference)	Command, especially latch command, interferes.
A.95E ^{*2}	Command Warning 5 (Subcommand Disable)	Subcommand and main command interfere.
A.95F ^{*2}	Command Warning 6 (Undefined Command)	Undefined command was sent.
A.960 ^{*2}	MECHATROLINK Communications Warning	Communications error occurred during MECHATROLINK communications.
A.971 ^{*3}	Undervoltage	This warning occurs before undervoltage alarm (A.410) occurs. If the warning is ignored and operation continues, an undervoltage alarm may occur.
A.9A0 ^{*1}	Overtravel	Overtravel is detected while the servomotor power is ON.

*1. Use Pn008.2 to activate or not the warning detection

*2. Use Pn800.1 to activate or not the warning detection

*3. Use Pn008.1 to activate or not the warning detection

Warning Number: Warning Name	Cause	Investigative Actions	Corrective Actions
A.900: Position Error Overflow	The servomotor U, and W wirings is faulty.	Check the servomotor main circuit cable connection.	Confirm that there is no contact fault in the motor wiring or encoder wiring.
	The SERVO PACK gain is too low.	Check the SERVO PACK gain.	Increase the servo gain by using the function such as advanced auto tuning.
	The acceleration of the position reference is too high.	Reduce the reference acceleration, and operate the SERVO PACK.	Reduce the reference acceleration of the position reference using a MECHATROLINK command, or smooth the acceleration of the position reference by selecting the position reference filter (ACCFIL) using a MECHATROLINK command.
	Setting of the excessive position error alarm level (Pn520) is low against the operating condition.	Check the alarm level (Pn520) to see if it is set to an appropriate value.	Set the Pn520 to proper value.
	A SERVO PACK fault occurred.		Turn the power supply to the SERVO PACK OFF and ON again. If the alarm still occurs, the SERVO PACK may be faulty. Replace the SERVO PACK.
A.901: Position Error Overflow Alarm at Servo ON	When the servomotor power is ON, the position error exceeded the parameter setting (Pn526xPn528/100).		Set an appropriate value for the excessive position error warning level at servo ON (Pn528).
A.910: Overload (Warning before the overload alarm (A.710 or A.720).)	Incorrect wiring or contact fault of servomotor and encoder.	Check the wiring.	Confirm that the servomotor and encoder are correctly wired.
	Operation beyond the overload protection characteristics.	Check the motor overload characteristics and executed run command.	Reconsider the load conditions and operating conditions. Or, increase the motor capacity.
	Excessive load was applied during operation because the servomotor was not driven due to mechanical problems.	Check the executed operation reference and motor speed.	Remove the mechanical problems.
	A SERVO PACK fault occurred.		The SERVO PACK may be faulty Replace the SERVO PACK.
A.911: Vibration	Abnormal vibration was detected at the motor speed.	Check for abnormal noise from the servomotor, and check the speed and torque waveforms during operation.	Reduce the motor speed or reduce the servo gain by using the function such as one-parameter tuning.
	The moment of inertia ratio (Pn103) value is greater than the actual value or is greatly changed.	Check the moment of inertia ratio.	Set the moment of inertia ratio (Pn103) to an appropriate value.

Warning Number: Warning Name	Cause	Investigative Actions	Corrective Actions
A.920: Regenerative Overload (Warning before the alarm A.320 occurs)	The power supply voltage exceeds the specified limit.	Measure the power supply voltage.	Set the power supply voltage within the specified range.
	Insufficient external regenerative resistance, regenerative resistor capacity, or SERVO PACK capacity. Or, regenerative power has been continuously flowing back.	Check the operating condition or the capacity using the capacity selection Software SigmaJunmaSize+, etc.	Change the regenerative resistance, regenerative resistor capacity, or SERVO PACK capacity. Reconsider the operating conditions using the capacity selection software SigmaJunmaSize+, etc.
	Regenerative power continuously flowed back because negative load was continuously applied.	Check the load to the servomotor during operation.	Reconsider the system including servo drives, machine, and operating conditions.
A.921: Dynamic Brake Overload (Warning before the alarm A.731 occurs)	The servomotor rotates because of external force.	Check the operation status.	Take measures to ensure the servomotor will not rotate because of external force.
	The rotating energy at a DB stop exceeds the DB resistance capacity.	Check the power consumed by DB resistance (Un00B) to see how many times the DB has been used.	Reconsider the following: - Reduce the motor reference speed. - Reduce the moment of inertia ratio. - Reduce the number of times of the DB stop operation.
	A SERVO PACK fault occurred.		The SERVO PACK may be faulty. Replace the SERVO PACK.
A.930: Absolute Encoder Battery Error (The absolute encoder battery voltage is lower than the specified value.) (Only when an absolute encoder is connected.)	The battery connection is incorrect.	Check the battery connection.	Reconnect the battery.
	The battery voltage is lower than the specified value 2.7 V.	Measure the battery voltage.	Replace the battery.
	A SERVO PACK fault occurred.		The SERVO PACK may be faulty. Replace the SERVO PACK.
A.94A Data Setting Warning 1 (Parameter Number Error)	Disabled parameter number was used.	Refer to 9.3 <i>Monitoring Communication Data on Occurrence of an Alarm or Warning</i> to determine which command was the cause of the warning.	Use the correct parameter number.
A.94B Data Setting Warning 2 (Out of Range)	Attempted to send values outside the range to the command data.	Refer to 9.3 <i>Monitoring Communication Data on Occurrence of an Alarm or Warning</i> to determine which command was the cause of the warning.	Set the value of the parameter within the allowable range.
A.94C Data Setting Warning 3 (Calculation Error)	Calculation result of set value is incorrect.	Refer to 9.3 <i>Monitoring Communication Data on Occurrence of an Alarm or Warning</i> to determine which command was the cause of the warning.	Set the value of the parameter within the allowable range.

Warning Number: Warning Name	Cause	Investigative Actions	Corrective Actions
A.94D: Data Setting Warning 4 (Parameter Size)	Parameter size set in command is incorrect.	Refer to 9.3 <i>Monitoring Communication Data on Occurrence of an Alarm or Warning</i> to determine which command was the cause of the warning.	Use the correct parameter size.
A.94E: Data Setting Warning 5 (Latch mode error)	Latch mode error is detected.	Refer to 9.3 <i>Monitoring Communication Data on Occurrence of an Alarm or Warning</i> to determine which command was the cause of the warning.	Change the setting value of Pn850 or the LT_MOD data for the LTMOD_ON command sent by the host controller to the proper value.
A.95A: Command Warning 1 (Unsatisfying Command)	Command sending condition is not satisfied.	Refer to 9.3 <i>Monitoring Communication Data on Occurrence of an Alarm or Warning</i> to determine which command was the cause of the warning.	Send a command after command sending condition is satisfied.
A.95B: Command Warning 2 (Non-supported Command)	SERVO PACK received unsupported command.	Refer to 9.3 <i>Monitoring Communication Data on Occurrence of an Alarm or Warning</i> to determine which command was the cause of the warning.	Do not sent an unsupported command.
A.95D: Command Warning 4 (Command Interference)	Command sending condition for latch related commands is not satisfied.	Refer to 9.3 <i>Monitoring Communication Data on Occurrence of an Alarm or Warning</i> to determine which command was the cause of the warning.	Send a command after command sending condition is satisfied.
A.95E: Command Warning 5 (Subcommand Disable)	Subcommand sending condition is not satisfied.	Refer to 9.3 <i>Monitoring Communication Data on Occurrence of an Alarm or Warning</i> to determine which command was the cause of the warning.	Send a command after command sending condition is satisfied.
A.95F: Command Warning 6 (Undefined Command)	Undefined command was sent.	Refer to 9.3 <i>Monitoring Communication Data on Occurrence of an Alarm or Warning</i> to determine which command was the cause of the warning.	Do not use an undefined command.
A.960: MECHATROLINK Communications Warning	MECHATROLINK wiring is incorrect.	Confirm the wiring.	Correct the MECHATROLINK wiring. Or, connect a terminal to the terminal station.
	MECHATROLINK data reception error occurred due to noise interference.	Confirm the installation conditions.	Take measures against noise. Check the MECHATROLINK communications cable and FG wiring and take measures such as adding ferrite core on the MECHATROLINK communications cable.
	A SERVO PACK fault occurred.		A fault occurred in the SERVO PACK. Replace the SERVO PACK.

Warning Number: Warning Name	Cause	Investigative Actions	Corrective Actions
A.971: Under voltage	For 100 VAC SERVO Packs: The AC power supply voltage is 60 V or less. For 200-VAC SERVO Packs: The AC power supply voltage is 140 V or less. For 400-VAC SERVO Packs: The AC power supply voltage is 280 V or less.	Measure the power supply voltage.	Set the power supply voltage within the specified range.
	The power supply voltage dropped during operation.	Measure the power supply voltage.	Increase the power supply capacity.
	Occurrence of instantaneous power interruption.	Measure the power supply voltage.	When the instantaneous power cut hold time (Pn509) is set, decrease the setting.
	The SERVO PACK fuse is blown out.		Replace the SERVO PACK and connect a reactor to the SERVO PACK.
	A SERVO PACK fault occurred.		The SERVO PACK may be faulty. Replace the SERVO PACK.
A.9A0: Overtravel (Overtravel status is detected.)	When the servomotor power is ON, overtravel status is detected.	Check the input signal monitor (Un005) to check the status of the overtravel signals.	Refer to 9.4 <i>Troubleshooting Malfunction Based on Operation and Conditions of the Servomotor</i>. Even if overtravel signals were not shown by the input signal monitor (Un005), momentary overtravel may have been detected. Take the following precautions. - Do not specify movements that would cause overtravel from the Host controller. - Check the wiring of the overtravel signals. - Take countermeasures for noise.

Maintenance Procedures

DIE BED CHANGE INSTRUCTIONS

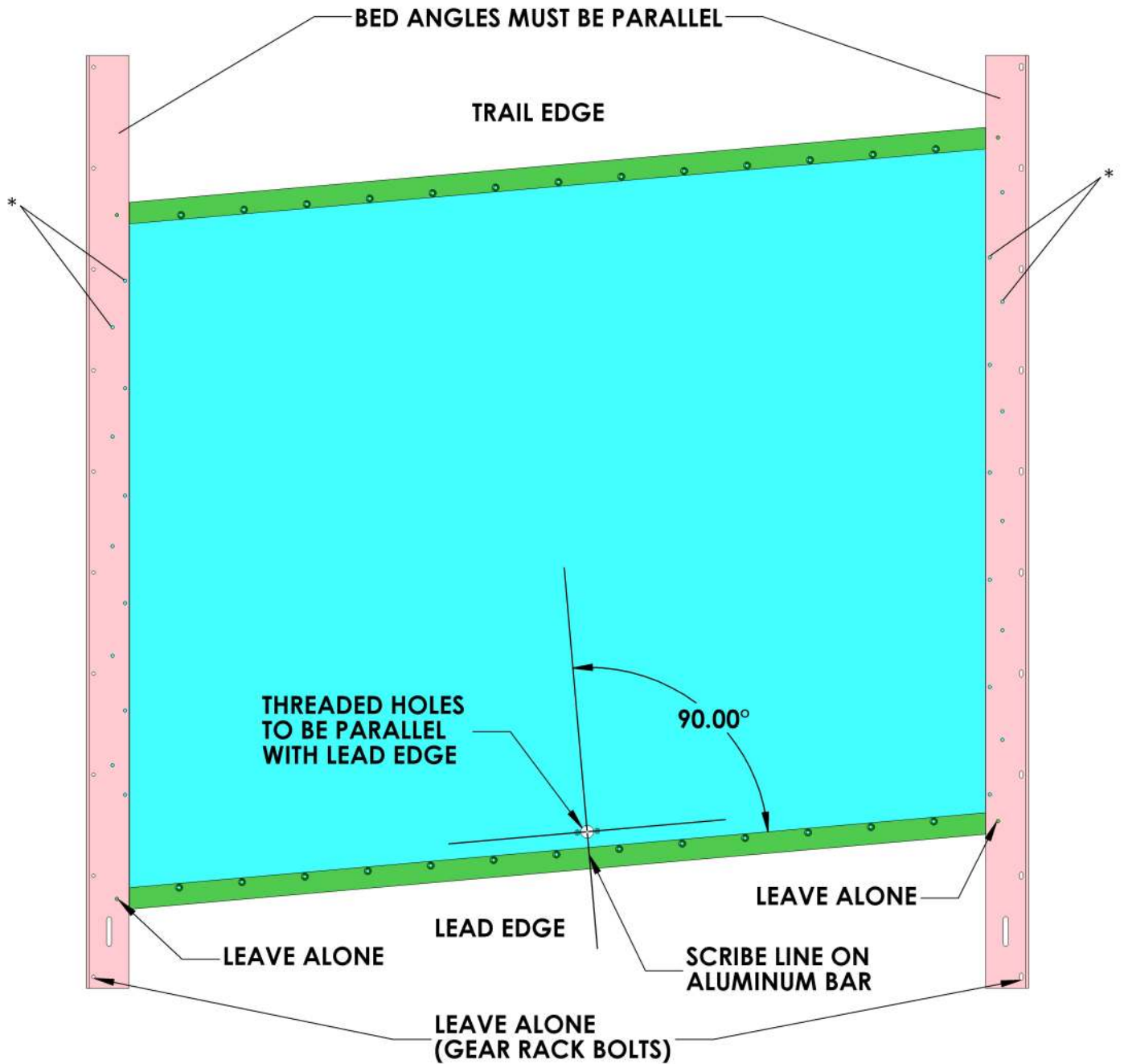
REMOVE OLD BED:

1. Move the bed about 3/4 of the way over the lower roll toward the unload end.
2. Transfer a centerline of the die latch nut by scribing on the lead edge aluminum bar for the purpose of relocating the new die latch hole onto the new bed.
3. Remove all the lead edge bolts as well as many bolts along the bed angles.
(Do not remove the bolts that secure the gear racks).
4. Inch the bed all the way to the load end.
5. Stack several pallets on the lift table and raise the them until touch the bottom of the bed.
(Do not over lift) This will support the bed from dropping to the floor.
6. Remove the remaining bolts from the bed angles and trail edge aluminum bar.
7. Carefully lower the lift table down to the floor. The bed should descend along with the pallets; leaving the framework in place **(it will be necessary to pull the bed material away from the card guides to clear them while descending).**

INSTALL NEW BED:

1. Use the old bed as template to transfer all side through holes only. **(Do not pre-drill and tap the lead and trail edge holes. That needs to be done when the bed in position of the frame)**
2. Lay the new bed on the same stack of pallets, raise it in place, and center it to the frame.
(Be caution to maintain bed material ascension around the card guides)
Once in position, maintain equal gap underside between the bed and the gear racks from both sides.
3. Double check the overall distance across the width comparing the front and rear end of the bed angles to make sure they are parallel. If they are not parallel, loosen one side and adjust until they are parallel.
4. Clamp, center punch, drill and tap the holes starting with a 3/16in pilot hole along the trail edge first **(be sure the bed is tight on the trail edge)**. Then use a 6.70 mm drill bit and M8 x 1.25 tap **(Do not use tap oil)**.
5. Use blue Loc Tite on the threads, install M8 x 1.25P x 25 mm FHSC bolts **(do not over tighten)**.
6. Sandwich, align the packer bar along with any thin shim stock between the bed and the aluminum angle. Re-drill clearance holes if necessary.
7. Install M8 x 1.25P x 45 mm SHCS bolts with washers and nyloc nuts (if possible, replace with new bolts).
8. Lower the lift table to the floor, remove the pallets, and inch the bed toward the delivery end to finish off the other half.

BED INSTALLATION



DIE LATCH HOLE INSTRUCTIONS

INSTALL DIE LATCH NUT:

NOTE: Practice with the router and test for depth on old bed material first.

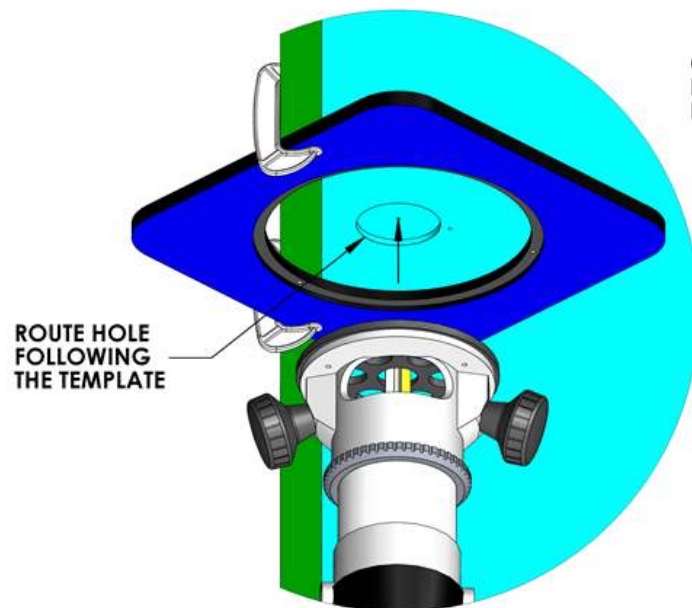
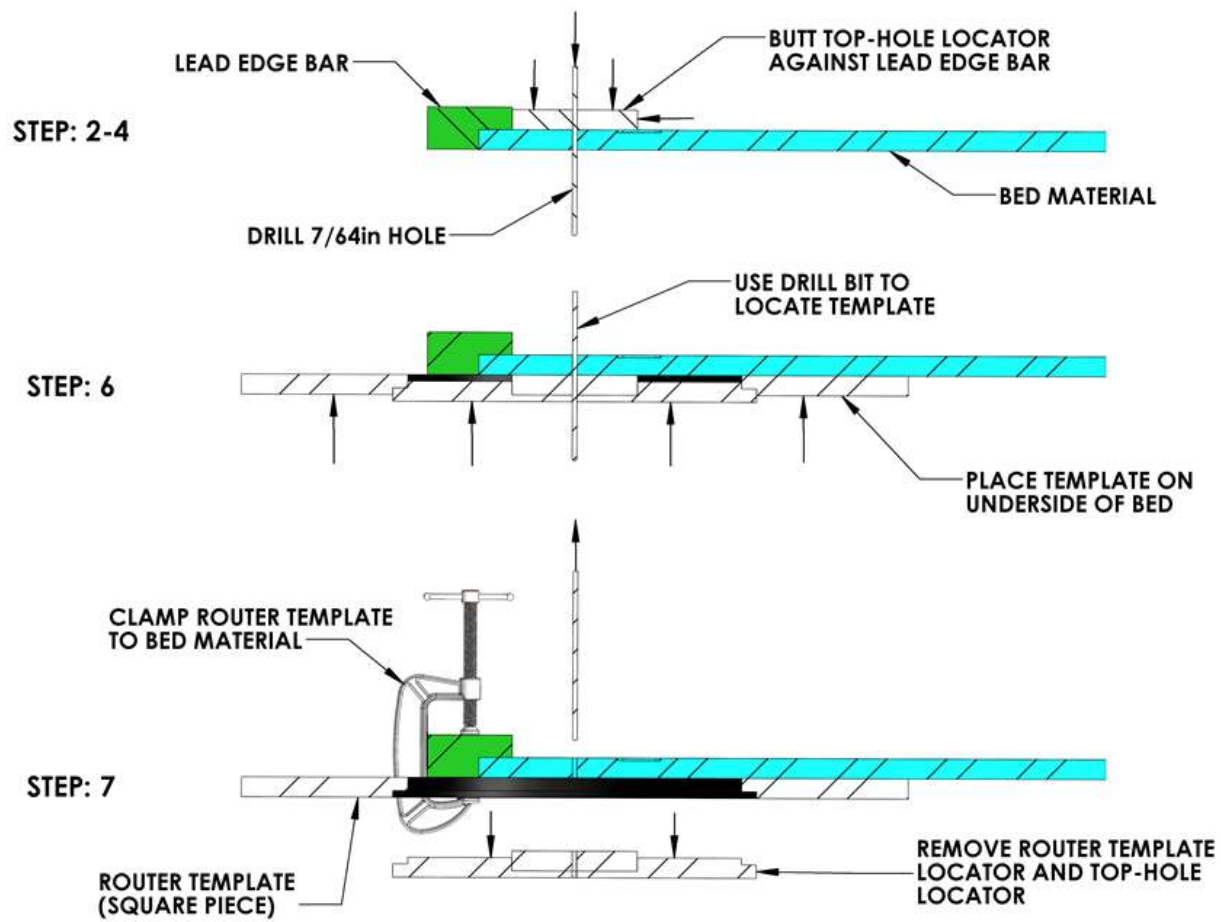
1. Transfer a pencil line onto the bed from the line scribed earlier on the lead edge bar.
2. Butt the small top-hole locator up against the lead edge bar. (See page 161)
3. Center the small top-hole locator with the line marked on the bed and secure it.
4. Drill into the small hole as a guide and all the way through the bed with a 7/64in bit.
5. Remove the small top-hole locator and place it back into the die latch hole template.
6. Use the same drill bit (7/64in) as a location guide for the locator assembly to be placed on the underside of the bed material.
7. Clamp the router template (square piece only) and remove the drill bit, the middle template locator and the small top-hole locator.
8. Set the router bit depth to be just greater than the shoulder thickness of the die latch nut, so that the die latch nut will just be a touch deeper than flush with the bottom of the bed.
(Practice first on old bed material).
9. Route the bottom of the bed by following the router template (square piece jig).
10. Use a 1-3/16in hole saw, align, center and drill half way into the bed from each surface to prevent chip blow out.
11. Place the die latch nut into the hole on the bottom of the bed and align the screw holes parallel with lead edge. Clamp use die latch as guide, center punch, first drill using 5mm drill bit through, then remove the die latch, drill 1/4in clearance, and carefully counter sink the holes from the top of bed surface.
12. Install die latch nut with M6 x 1.0P x 14mm FHSC. Use Loc Tite and if necessary, carefully grind M6 bolts flush on the underside).

We can provide these tools...

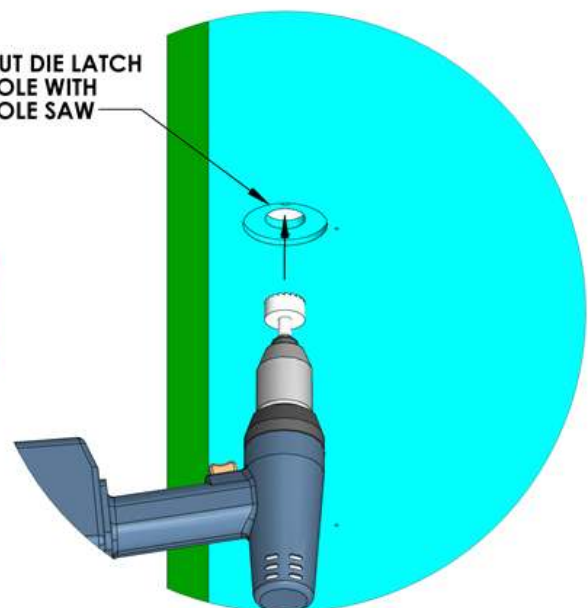
9000-045	Router with a 6in base plate
9000-046	1/2" dado with 1/2" shank router bit
9000-047	1-3/16" hole saw
9000-048	7/64" drill bit
9000-087	hole saw arbor
9000-067	M8 x 1.25 tap
9000-086	6.7mm drill bit
9500-066	Die Latch Template (Three piece kit)
9000-044	Die Latch Center hole locator replacement

Any type of router with a six inch base plate and 1/2in dado bit will suffice.

HOLE INSTALLATION



STEP: 9



STEP: 10

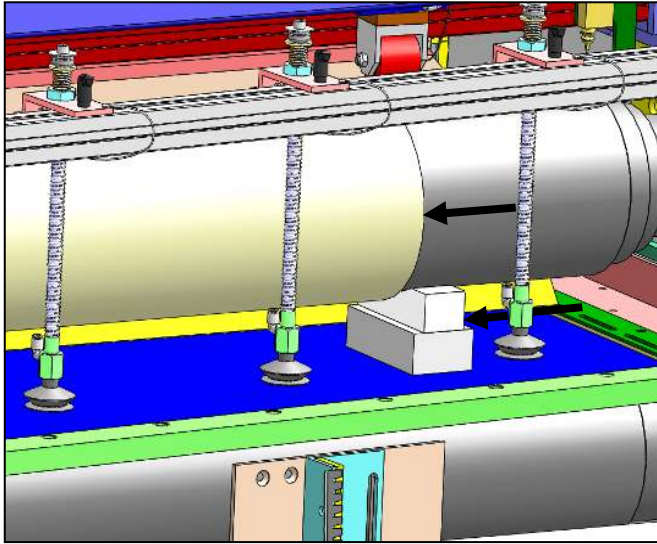
SLEEVE CHANGE INSTRUCTIONS

WARNING: Before entering inside the machine, always make sure to turn the **KEYED LOCK-OUT SWITCH** to the **LOCK-OUT** position, remove the **KEY**, and take it with you.

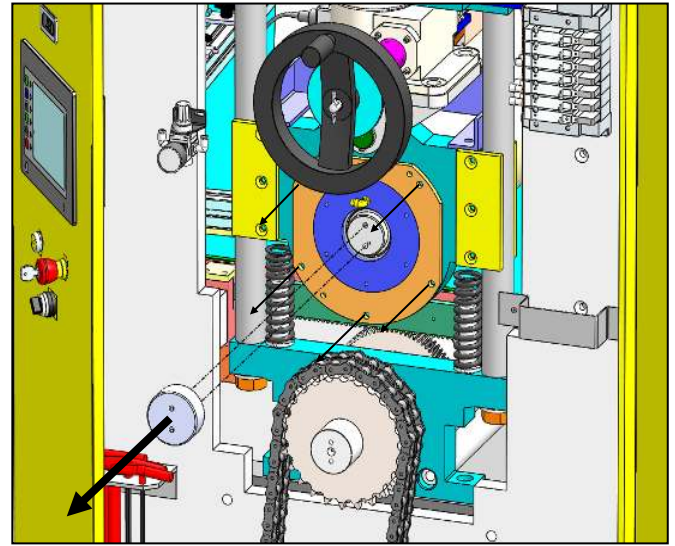
1. On large dies, you may need to remove the leveling die and existing die before starting the sleeve change.
2. On the operator's panel touch screen, press the "Initiate Sleeve Change" icon button. The bed should automatically move to its sleeve change position (be sure the roll up doors are down).
3. Raise the doors and **Lock-Out** the machine. Loosen the sleeve limit switch kip handle located on the operator side and flip the arm up.
4. Turn the sleeve traverse pressure regulator to 0 psi. If necessary, manually lift the wheels to clear the sleeve.
5. Slide the sleeve toward the operator side as far as it can go, until it is up against the bearing housing.
6. Temporarily remove the anvil adjusting hand wheel to open the cabinet doors, replace the hand wheel and rotate it counter clockwise until the digital read out reads approximately 2.050. This elevate the anvil high enough for the two-piece V-block cradle to fit between the upper roll and die bed (best to have an assistance in this procedure).
7. Slip, first the V-block cradle and then insert the flat supporting spacer plate under the V-block. Place the blocks approximately 13mm (1/2in) away from the edge of the sleeve in case the new sleeve is slightly longer.
8. Rotate the anvil adjusting hand wheel clockwise to lower the upper roll onto the cradle until there is slight resistance (**DO NOT OVER CRANK**).
9. Remove the center cap in the roller bearing housing and the five bearing housing bolts.
10. Jack the housing off using the jacking T-handles provided. Be careful not to drop the housing. It is heavy and frees quickly. (not unusual for the anvil to flex downward out of center position)
11. Carefully set the bearing housing on the floor nearby.
12. Remove the sleeve, slide in the new sleeve and reverse the process.
13. If necessary, rotate anvil adjusting hand wheel to help align the bearing housing to slide back into position. (**DO NOT POUND OR USE EXCESSIVE FORCE TO POSITION IT**). Insert the center cap back on.
14. Reset the sleeve traverse pressure regulator back to 20psi.
15. flip sleeve limit switch arm down and tighten kip handle into position.
16. Make sure all tools including the two-piece V-block cradle and jacking T-handles are put back into it's corresponding storage holders and the bed is clear.
17. Install a cutting die and the leveling die onto the bed (if removed). Rotate anvil adjusting hand wheel clockwise until sleeve barely touch the highest point of the die or refer to digital read out for cut height.
18. Temporarily remove the anvil adjusting hand wheel to close the cabinet doors, replace the hand wheel.
19. Run machine and slowly crank the anvil down until cutting is satisfactory performed.

Bearing housing jacking T-handles and two-piece V-block cradle are located in the operator side guard.

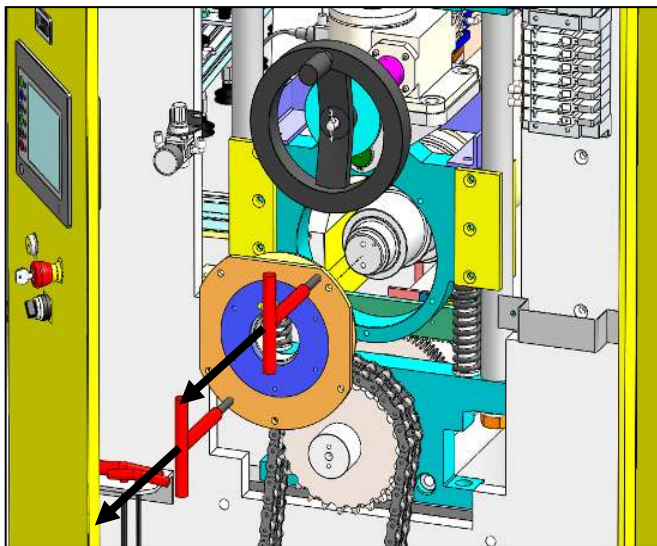
SLEEVE CHANGE



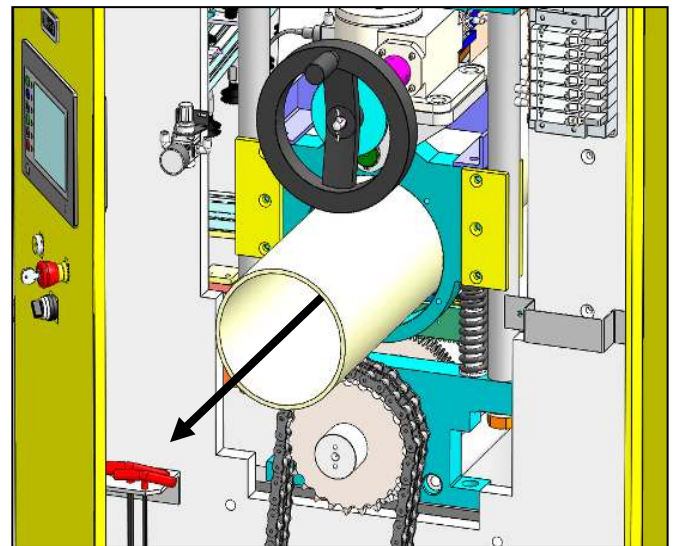
STEP 5 - 8: V-BLOCK PLACEMENT



STEP 9: CAP AND BOLT REMOVAL



STEP 10: BEARING HOUSING REMOVAL



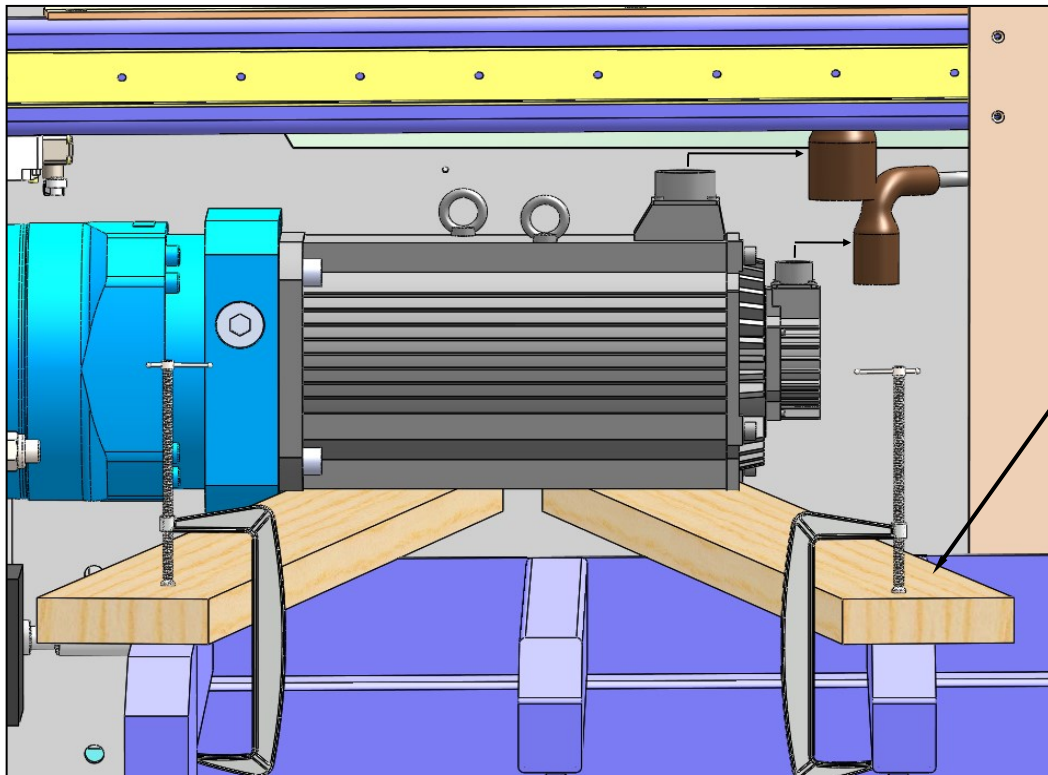
STEP 12: SLEEVE REMOVAL

MAIN SERVO CHANGE INSTRUCTIONS

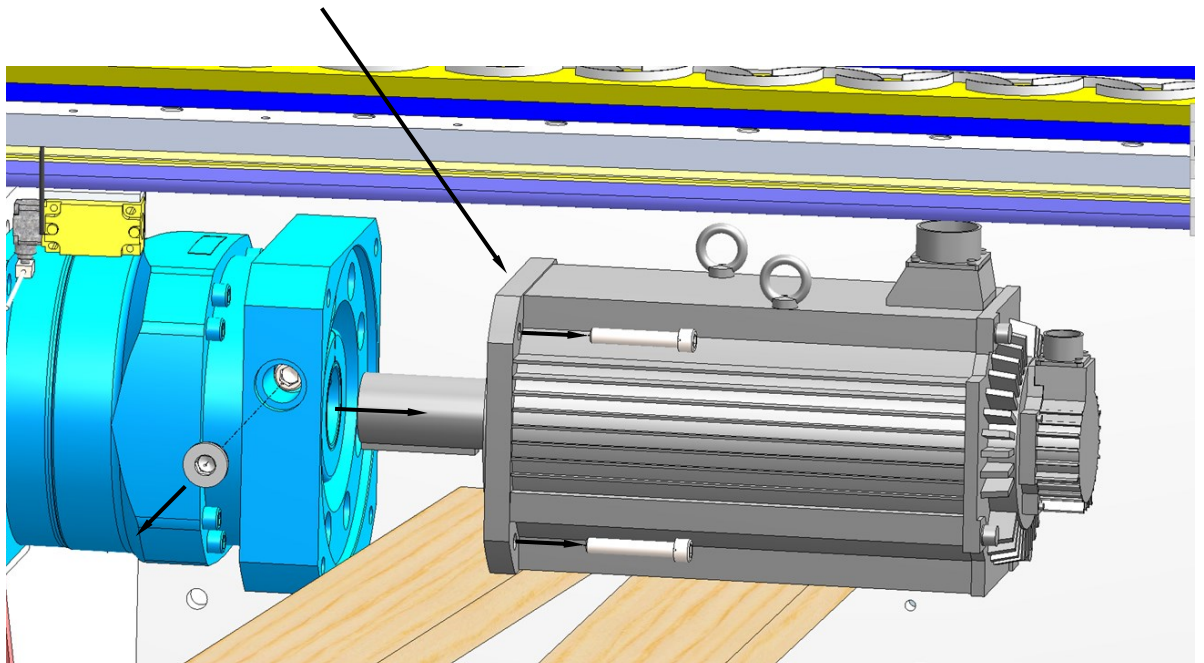
WARNING: Before entering inside the machine, always make sure to turn the **KEYED LOCK-OUT SWITCH** to the **LOCK-OUT** position, remove the **KEY**, and take it with you.

1. Remove the cooling fan box. (Not Shown)
2. Carefully support the motor unit from underneath using the load table, 2 x 6 wood for extension arms and clamps. (See Diagram, above left)
3. Support the motor so that it is perfectly level. There must be no radial or axial loading on the shaft.
4. Make sure the machine is powered down and disconnected then remove the two (2) electrical cables from the motor.
5. Remove the aluminum hex plug on the gearbox with 17mm hex wrench. (See Diagram, above right)
6. Loosen, but do not remove the hex bolt from inside the resulting hole with 14mm hex wrench. You may need to rock the bed backwards and forwards to rotate the motor shaft slightly to see and align the internal bolt. **Be sure to protect the access plug hole threads** from damage by isolating the wrench with either a plastic plug or by wrapping the wrench shaft with tape. The bolt will be tight (240 foot pounds). It will take some force to loosen.
7. Remove the four (4) hex bolts with 10mm hex wrench that secure the motor to the gearbox. (See Diagram, above right)
8. The motor should now pull free of the gearbox.
9. Carefully insert the new motor shaft all the way into the gearbox. Do not use excessive force or damage will result.
10. Replace the bolts that hold the motor to the gearbox and torque to 65 foot pounds.
11. Using a torque wrench with 14mm hex wrench, tighten the clamp inside the gearbox to 240 foot pounds. **Be sure to protect the access plug hole threads** from damage.
12. Replace the aluminum hex plug and the electrical cables.
13. Install the cooling fan box. (Not Shown)

MAIN SERVO



STEP 4 - 7: REMOVE SERVO



ROLL PARALLEL INSTRUCTIONS

WARNING: Before entering inside the machine, always make sure to turn the **KEYED LOCK-OUT SWITCH** to the **LOCK-OUT** position, remove the **KEY**, and take it with you.

1. Home the machine. Be sure bed is not resting and is clear of the lower roll.
2. From the HMI, put the anvil into the downward position.
3. Turn the sleeve traverse pressure valve to 0 psi and slide anvil sleeve toward the middle of the roll.
4. Find or machine 1.5" to 2.0" OD shaft, preferably a chrome plated shaft with a clean, smooth, rust free surface. Rest and hold the shaft on the lower roll. Make sure to place gauge shaft as far out on the lower roll face as possible. Turn the Nook shaft inside of machine by hand to bring the upper anvil roll down until just touching the gauge shaft.
5. With the same shaft check the opposite side of roll. Use it as "feeler" gauge. The gauge shaft should not be stuck between rolls but rather just slips.

OR

Use adjustable parallel bars, align, slide until touching and measure with caliper for more accuracy.
(Example not shown)

6. If the rolls are out of parallel...
 - a. Remove Nook coupling chain that wraps and holds the two sprockets (locate connecting link). The long shaft rod will sag down about 4". This is normal.
 - b. Rotate one or the other shaft until anvil roll feeler gauge the same on both end.
 - c. Wrap Nook chain back on sprockets and secure in place.
 - d. Repeat steps 4 and 5 to verify rolls are parallel.

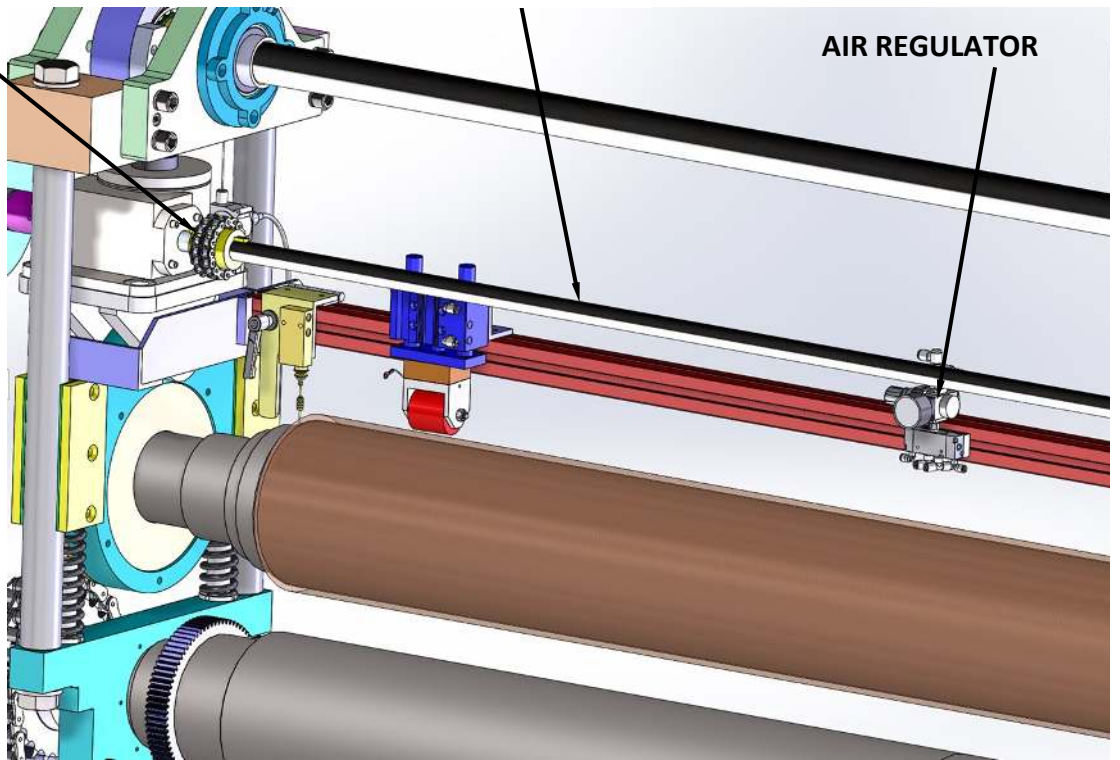
ROLL PARALLEL

NOOK COUPLING

NOOK SHAFT

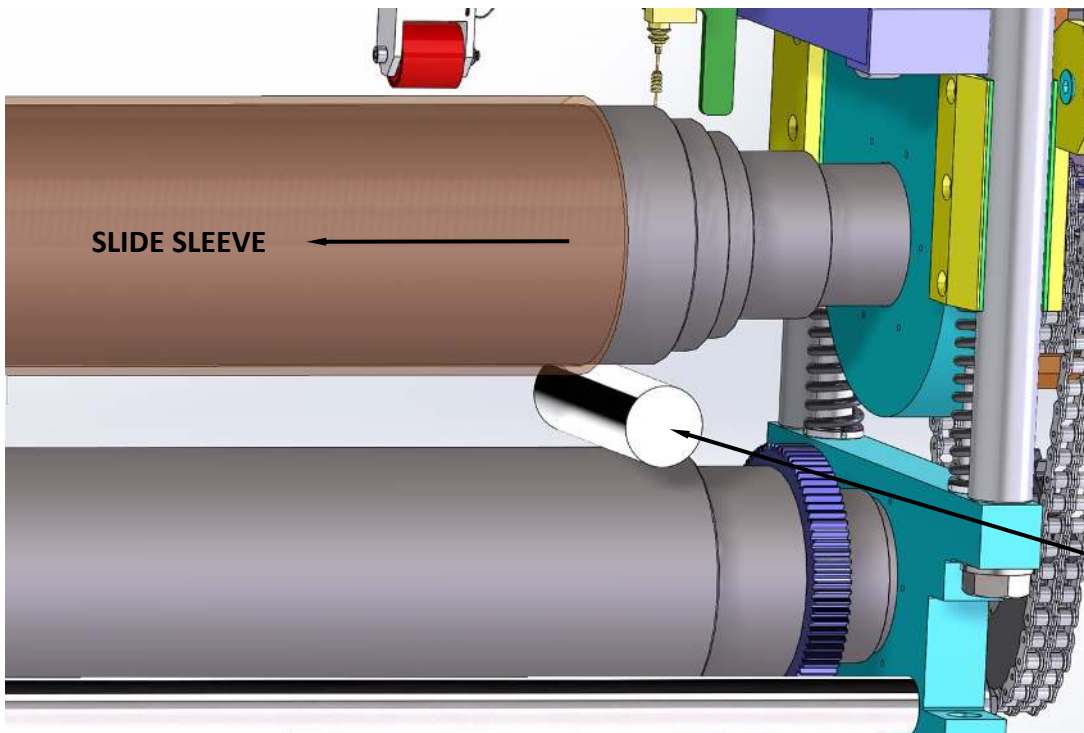
AIR REGULATOR

SET ANVIL
DOWNWARD



SLIDE SLEEVE

CHROME PLATED
SHAFT



SPRAG SPROCKET AND CLUTCH ASSEMBLY

Parts Required:

- 4500-199 - Sprag Clutch Sprocket
- 4500-127 - Needle Bearing w/ Bearing Race
- 9500-026 - One Way Clutch
- 7000-144 - Small Brass Thrust Disk
- 7000-145 - Large Brass Thrust Disk
- 2500-033 - Clutch Key
- 2500-038 - Special Notch Key
- 1000-498 - M6 x 1.0 x 20mm FHCS (12pcs Required)
- 2500-037 - External 50mm Retaining Ring
- 2500-061 - Internal 2.813 Retaining Ring
- 2000-070 - Sprag Bearing Spacer

1. Install **2500-061** - Internal Retaining Ring into 72mm bore.
2. Insert **4500-127** - Needle Bearing into **4500-199** - Sprocket

NOTE: Bearing will fall through without retaining ring installed.

3. Install **7000-144** - Small Thrust Disk with **M6 x 1.0 x 20mm FHCS** (not shown).

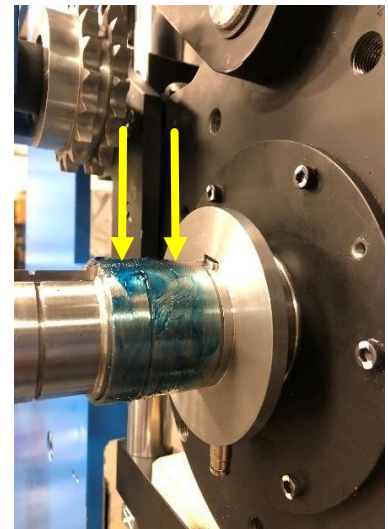
NOTE: Torque M6 x 1.0 x 20mm FHCS to 13ft/lbs.



4. Slide **4500-127** - Bearing Race and **2000-070** - Bearing Spacer into place on the shaft

NOTE: Race and Spacer should slide easily in that order sequence.

5. Grease the outer portion of Race and Spacer after in position.



6. Slide Sprocket onto Upper Roll Shaft until assembly cannot go farther. Make sure **4500-127** - Needle Bearing is positioned over the Bearing Race.

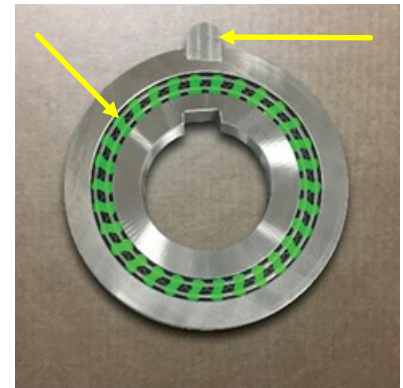
NOTE: Orientation of sprocket assembly and Sprocket should spin freely in either direction.



CORRECT

7. Insert **2500-033** - Clutch Key into outer race keyway of **9500-038** - Clutch Assembly as shown.

NOTE: Orientation face of **LOCKING DOGS** should be pointing **CLOCKWISE**.
The Outer race should freely turn **CLOCKWISE** while holding inner race stationary.



INCORRECT

8. Fill grease inside **9500-026** - Clutch Assembly.
9. Press Clutch Assembly into Sprocket Assembly with **2500-038** - Special Notch Key and **2500-033** - Clutch Key in respective key slots. A hammer and soft brass punch may be used to insert keys.

NOTE: DO NOT DAMAGE CLUTCH. Sprocket with anvil roll should be...

Free: Clockwise

Engage: Counter-clockwise

NOTE: Clutch should be inserted past the retaining ring groove in upper roll.
All keys should be flush with clutch face.

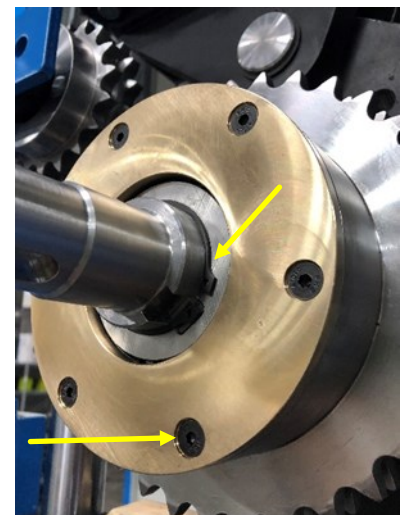


10. Install **2500-037** - Retaining Ring onto upper roll to secure Clutch in place.

NOTE: Failure to install retaining ring will result in machine damage.

11. Install **7000-145** - Large Thrust Disk with **M6 x 1.0 x 20mm FHCS** as shown.

NOTE: Torque **M6 x 1.0 x 20mm FHCS** to 13ft/lbs.



NOOK ANTI-BACKLASH ADJUSTMENT

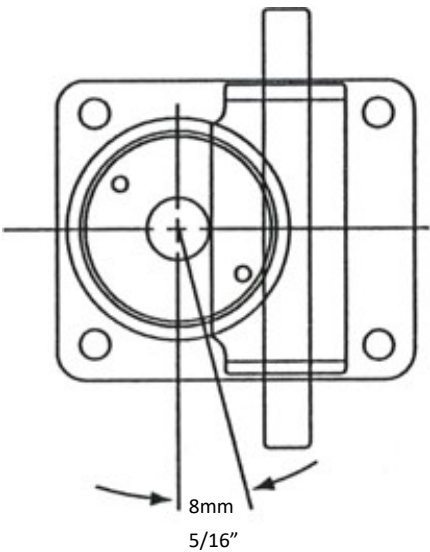
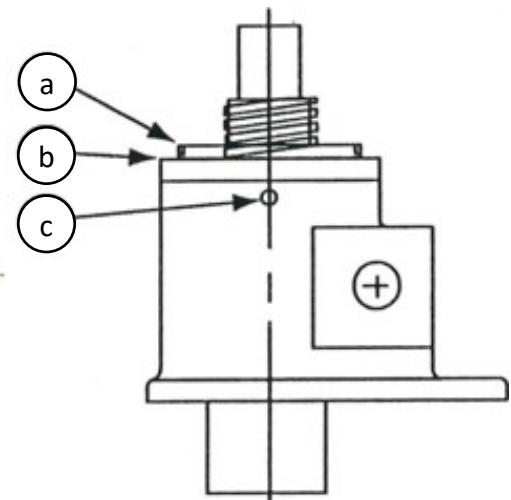
WARNING: Before entering inside the machine, always make sure to turn the **KEYED LOCK-OUT SWITCH** to the **LOCK-OUT** position, remove the **KEY**, and take it with you.

The anti-backlash feature is set at the factory and normally does not require further adjustment. However, as wear develops with extended use, it may become necessary to adjust lash.

ADJUSTMENT PROCEDURE

- 1. With chain wrench, loosen Locknut. (Item b)
- 2. Loosen the two Set Screws. (Item c)
- 3. To reduce backlash, rotate Adjusting Cap (Item a) by hand, clockwise until resistance is felt. (Do not over tighten)
- 4. Mark a reference line between thread on Adjusting Cap and Housing.
- 5. Rotate Adjust Cap counter clockwise with the reference lines spread apart by 8mm or 5/16".
- 6. Tighten Set Screws (will hold Adjusting Cap stationary for the next step).
- 7. Tighten Locknut with chain wrench. (Item b)
- 8. Operate jack through entire stroke, checking for tight spots. Note: If jack has been used only over a portion of its stroke, backlash should be adjusted in the lease worn portion of the screw.

CAUTION: Care should be taken not to overtighten the anti-backlash system in order to prevent binding or lockup between the drive nut and lifting screw. Overtightening can cause a destructive heat buildup or failure.



Item	Description
a	Adjusting Cap
b	Locknut
c	Set Screw

MAINTENANCE SCHEDULE

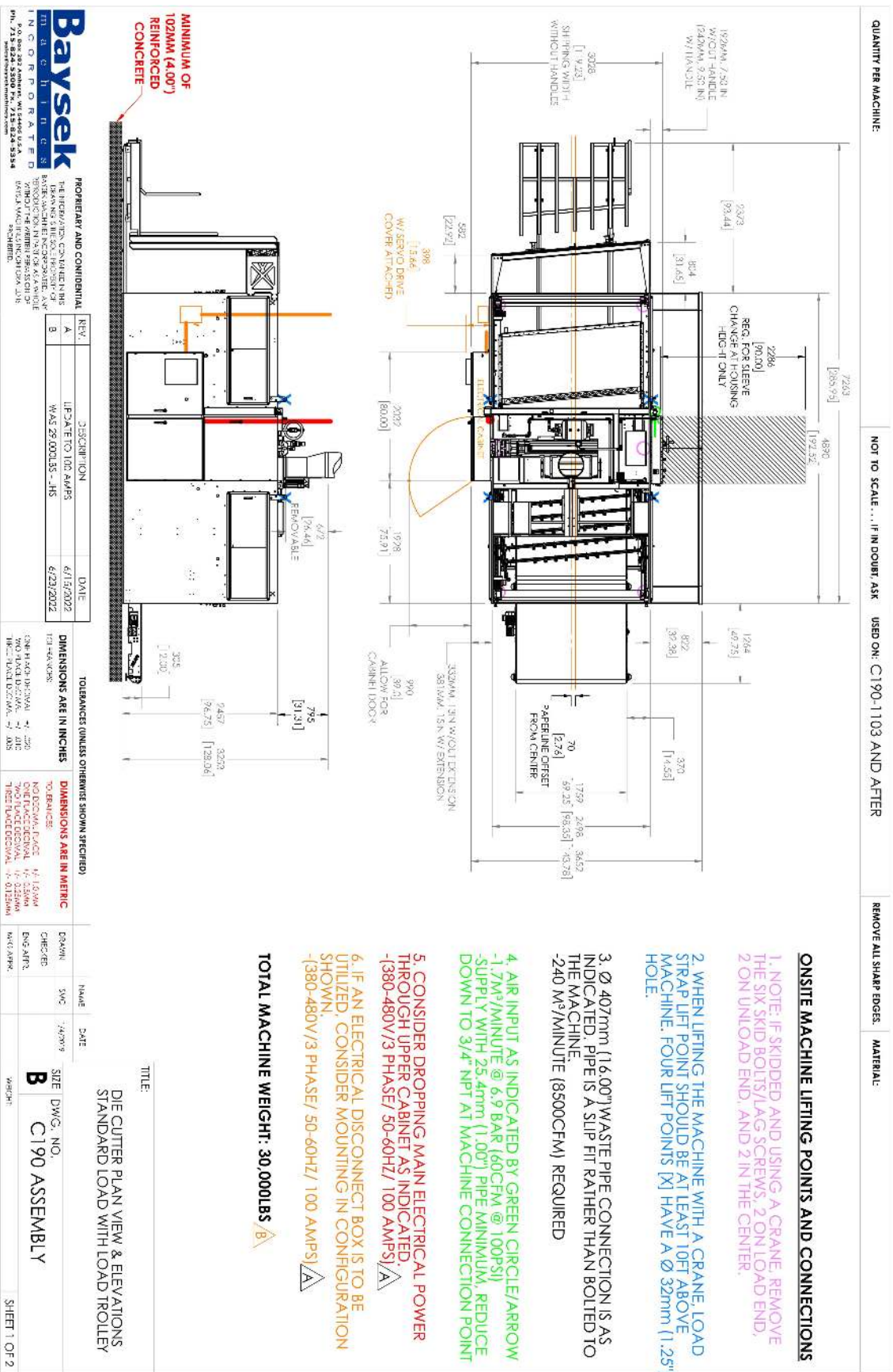
<u>Item</u>	<u>Lube Interval</u>
Bed bearings	50,000 passes
Linear bearings	50,000 passes
Gear racks	50,000 passes
Pillow bearings on lifts	100,000 passes
Roller bearings	100,000 passes
Plain bearings	100,000 passes
Pillow bearings on servos	100,000 passes
Rod ends on servos	100,000 passes
Drive chains (spray Lube)	100,000 passes
One way clutch	500,000 passes
Blow dust from Roller Brake / Clutch	500,000 passes
Blow dust from Vacuum Generators	when needed
Replace drive and one-way clutch chains	1 million passes

(Recommended Grease: Mobile HPX-222 or Food Grade: Mobile Polyrex-222)

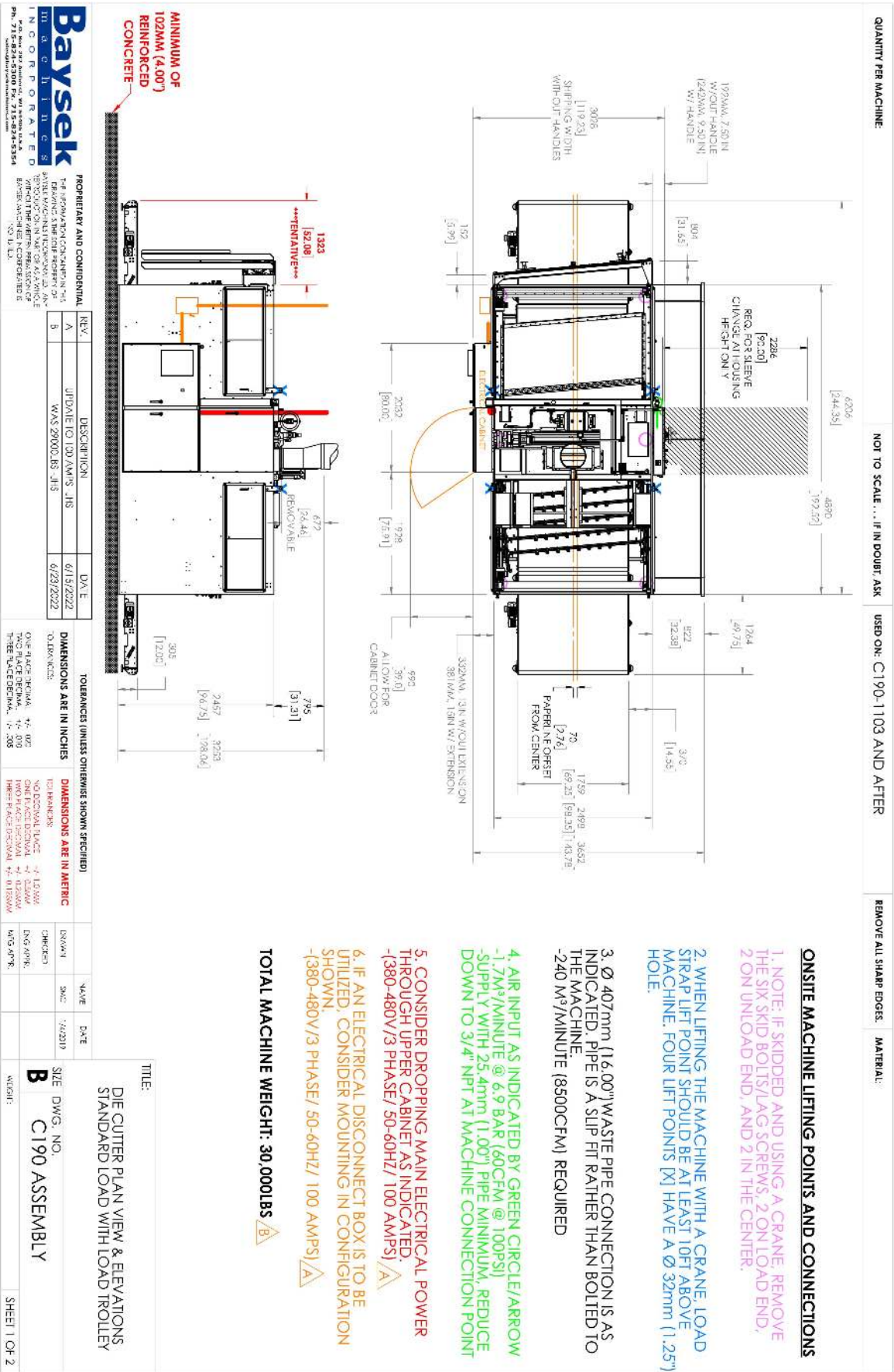
Electrical

Blow out dust and debris from regen resistors (on roof)	250,000 passes
Check sensor caps are tight (bed, load and unload servos)	250,000 passes
Blow out fans and filters (on cabinet)	500,000 passes
Blow out drives (from bottom to top)	500,000 passes
Check that Photo eyes are clean	500,000 passes

STANDARD LOAD - FOOTPRINT

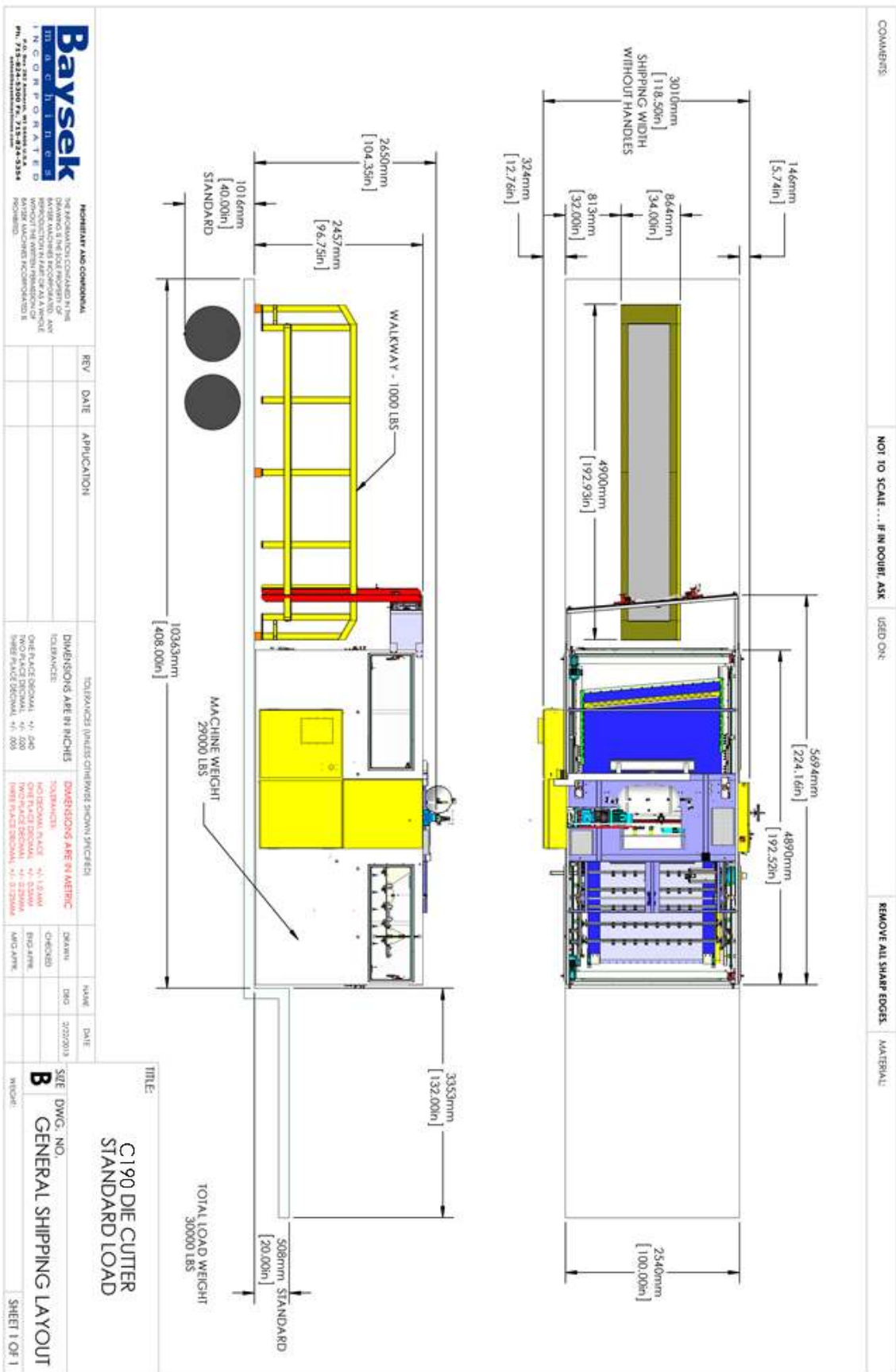


AUTO LOAD - FOOTPRINT

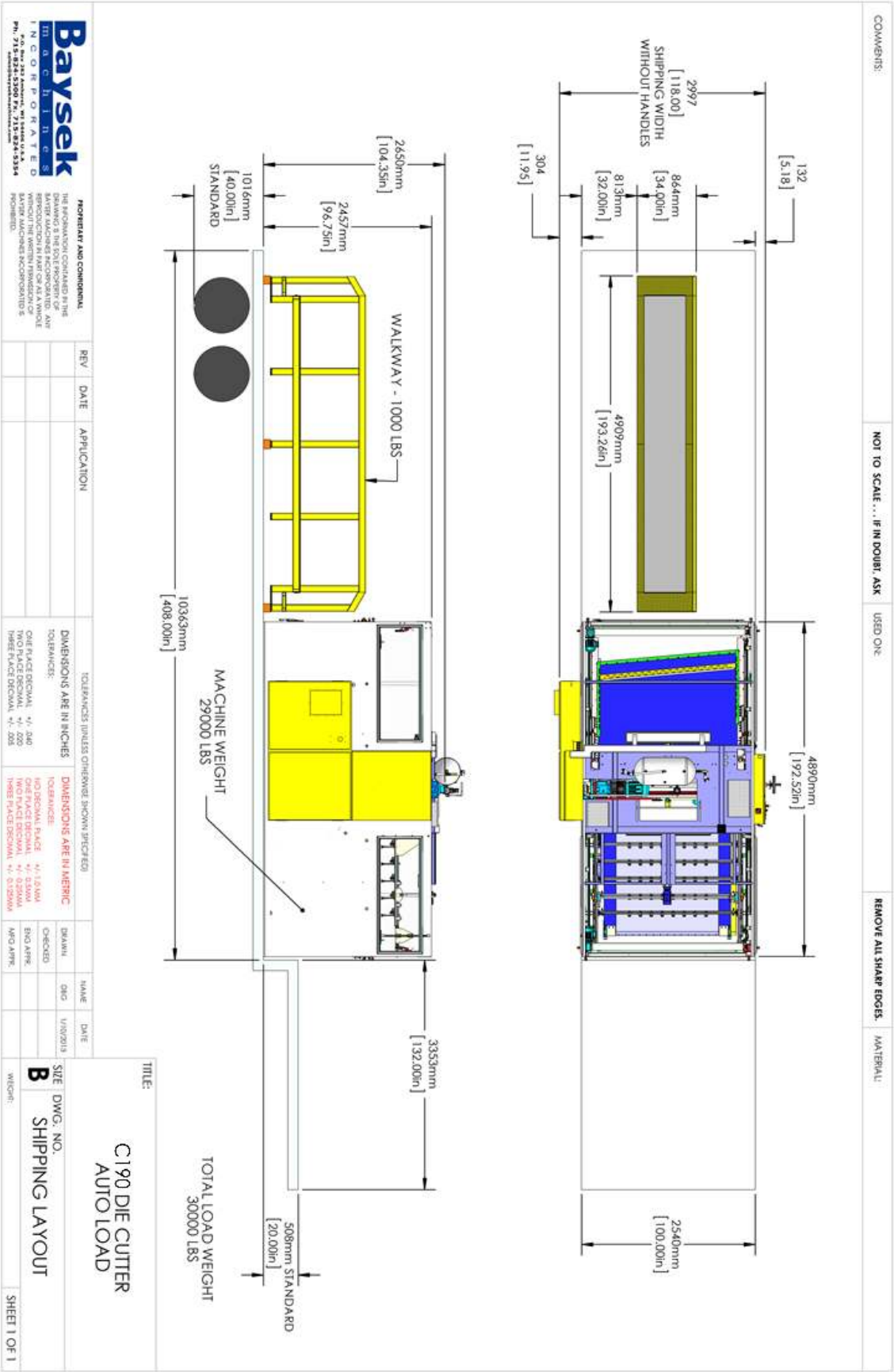


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AUTO LOAD - SHIPPING LAYOUT (DOMESTIC ONLY)



Electrical

Supplement

Male Elbow



MALE ELBOW					
	A				
B	4mm	6mm	8mm	10mm	12mm
M5 x 0.8 (-M5)	3500-214				
1/8 RPT (-01)	3500-205	3500-306			
1/4 RPT (-02)		3500-307	3500-406	3500-504	
1/4 RPT (-02)	EXTENDED			3500-511	
1/8 UNI (-U01)	3500-213	3500-317		3500-514	
1/4 UNI (-U02)	3500-216	3500-319	3500-414	3500-515	
3/8 UNI (-U03)				3500-517	

Plug-In Elbow



PLUG-IN ELBOW					
	A				
B	4mm	6mm	8mm	10mm	12mm
6mm Plug-In		3500-323			
10mm Plug-In		3500-334			

Straight Union



STRAIGHT UNION					
	A				
B	4mm	6mm	8mm	10mm	12mm
4mm	3500-202	3500-303			
6mm		3500-316	3500-402		
8mm			3500-403	3500-501	
10mm			3500-415	3500-502	
12mm					3500-602

Different Dia. Straight



MALE CONNECTOR					
	A				
B	4mm	6mm	8mm	10mm	12mm
M5 x 0.8 (-M5)	3500-217	3500-321			
1/8 RPT (-01)	3500-203	3500-304			
1/4 RPT (-02)	3500-204	3500-328	3500-404	3500-503	
3/8 RPT (-03)					
1/2 RPT (-04)					3500-605
1/8 UNI (-U01)	3500-215	3500-320	3500-413		
1/4 UNI (-U02)	3500-212	3500-318		3500-516	
3/8 UNI (-U03)		3500-329		3500-510	
1/2 UNI (-U04)					

Male Connector



Plug-In Reducer



PLUG-IN REDUCER					
	A				
B	4mm	6mm	8mm	10mm	12mm
6mm Plug-In	3500-219				
8mm Plug-In		3500-330			
10mm Plug-In		3500-331			
12mm Plug-In				3500-518	

Union Tee



UNION TEE					
	A				
B	4mm	6mm	8mm	10mm	12mm
4mm	3500-210				
6mm		3500-309			
8mm			3500-408		
10mm				3500-509	
12mm					3500-600

Branch Tee



UNION TEE & BRANCH TEE					
	A				
B	4mm	6mm	8mm	10mm	12mm
1/8 RPT (-01)	3500-207	3500-310			
1/4 RPT (-02)		3500-311	3500-409	3500-506	

Plug-In "Y"



UNION TEE & BRANCH TEE					
	A				
B	4mm	6mm	8mm	10mm	12mm
6mm Plug-In		3500-324			

Male Run Tee



MALE RUN TEE					
	A				
B	4mm	6mm	8mm	10mm	12mm
1/8 RPT (-01)	3500-208	3500-312			
1/4 RPT (-02)		3500-313	3500-410	3500-507	

Triple Elbow



MALE RUN TRIPLE ELBOW					
	A				
B	4mm	6mm	8mm	10mm	12mm
1/8 RPT		3500-220			

Plug



Solid Plug



PLUG					
	A				
B	4mm	6mm	8mm	10mm	12mm
PLUG	3500-206	3500-308	3500-407	3500-505	
SOLID PLUG		3500-327			

Cap



CAP					
	A				
B	4mm	6mm	8mm	10mm	12mm
CAP	3500-218	3500-332		3500-513	

Bulkhead Union



BULKHEAD					
	A				
B	4mm	6mm	8mm	10mm	12mm
BULKHEAD	3500-201	3500-302	3500-401	3500-500	

Union "Y" KQU



UNION "Y" KQU					
	A				
B	4mm	6mm	8mm	10mm	12mm
UNION "Y" KQU		3500-322			

Male Straight



SELF SEAL CONNECTOR					
	A				
B	4mm	6mm	8mm	10mm	12mm
1/8 RPT (-01)	3500-200	3500-300			
1/4 RPT (-02)		3500-301	3500-400		

Solenoid Breather
Vent (Exhaust)

EXHAUST FITTING					
	A				
B	1/8 NPT	1/4 NPT	3/8 NPT		
BREATHER	3500-315	3500-601	3500-412		

Quick Exhaust Vent



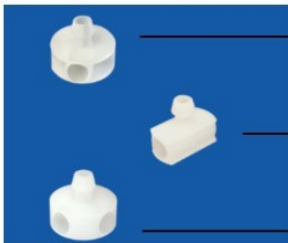
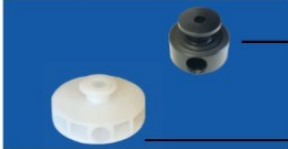
EXHAUST FITTING					
	A				
B	4mm	6mm	8mm	10mm	12mm
QUICK		3500-337			

Flow Control



Flow Control					
	A				
B	4mm	6mm	8mm	10mm	12mm
Flow Control		3500-336			

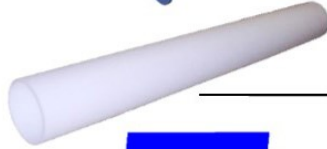
CONSUMABLE PARTS

			
TOOLING COMPONENTS	PART #	PART DESCRIPTION	USD PRICE/EA
Die Bed Suction - Small			
	4900-043	B15 Suction Cup, 15mm diameter (Fits 3500-001, 3500-011M & 3500-024)	
	4900-016	B20 Suction Cup, 20mm diameter (Fits 3500-001, 3500-011M & 3500-024)	
	4900-017BU	B28 Blue Suction Cup, 28mm diameter (Fits 3500-001, 3500-011M & 3500-024)	
	4900-017	B28 Black Suction Cup, 28mm diameter (Fits 3500-001, 3500-011M & 3500-024)	
	3500-001	B21 Barbed Suction Cup Holder	
	3500-001M	Modified B21 Base	
	3500-024	90° (Right Angle) Base	
Die Bed Suction - Large			
	4900-018BU	B30 Blue Suction Cup, 35mm diameter (Fits 3500-002 & 3500-011)	
	4900-050	33F Blue Suction Cup, 25mm diameter (Fits 3500-002 & 3500-011)	
	4900-019	32W-3 Lead Edge Suction Cup, 40mm (Fits 3500-002 & 3500-011)	
	4900-020	32W Suction Cup, 45mm diameter (Fits 3500-002 & 3500-011)	
	4900-022	33-A-2 Suction Cup, 33mm diameter (Fits 3500-002 & 3500-011)	
	3500-002	B31 Suction Cup Holder	
	3500-011	B31-L Flange Suction Cup Holder	

Revised June 2021

**All prices subject to change

TOOLING COMPONENTS	PART #	PART DESCRIPTION	USD PRICE/EA
Load/Unload Suction Cups			
     	4900-031	VSA-53 Suction Cup (Load) 53mm diameter	
	4900-032	VSA-43 Suction Cup (Unload) 43mm diameter	
	3500-025	HS6mm Fixing Screw (Fits 4900-031 and 4900-032)	
	4900-037	VSA-25 Suction Cup 25mm diameter	
	3500-041	M6 Male Insert Adapter (Fits 4900-037)	
	9500-046	4900-037 + 3500-041	
Die Plumbing			
        	9500-079	Insertion Tool Set - Small Bases	
	9500-028	Insertion Tool Set - Large Bases	
	3500-327	6mm x 38 mm Solid Plug	
	3500-061	Barbed L-Connector	
	3500-062	Barbed T-Connector	
	6500-007	6mm Black PE Tubing 150 Meter Spool	
	9500-056	Mini Tube Cutter w/ Die Hole Locator	
	9000-024	Deluxe Tube Cutter	
	9000-011	Mini Tube Cutter	

TOOLING COMPONENTS	PART #	PART DESCRIPTION	USD PRICE/EA
Miscellaneous			
	9500-040L	12 Port Assembly Bed Manifold—Left	
	9500-040R	12 Port Assembly Bed Manifold—Right	
	4900-036	Vacuum Generator—Unload Bar Vacuum Generator—Bed Suction	
	3500-300	M6 x 1/8 RPT Self Seal Fitting (Used on Unload Frame)	
	3500-304	6mm x 1/8 RPT	
	4000-036	Anvil Cutting Sleeve Sizes 8" x 71" 8" x 74" uncut 8" x 73" 8" x 81"-85" special	
	7000-200A	Bed Material 85" x 63" (2160mm x 1600mm) With steel bed saver	
	9500-037	Sleeve Traverse Wheel w/Bearings	
	1000-425N	Die Latch Captive Bolt	
	1500-028N	Die Latch Captive Nut	
	3500-316	6mm Straight Union Fitting	
	4900-009	6mm 6mm 8mm Vac. Generator (Load Bar)	
	4500-047	SSR25 Linear Bearing	
	4500-156	FBW3590XRUU Bearing	

DIE BOARD RACK SYSTEM (OPTIONAL)

Baysek Machines Inc offers affordable Die Board Rack System.

Safely store all your cutting dies in one place.

Rack system prevents damage to cutting knife and airlines.

This model shown is: 8 ft wide x 10 ft tall x 4 ft deep.

Each shelf holds 63 die boards, 126 total dies per rack.

Shelf height is adjustable.

Call for price quote and different configuration options

