

"
"
"
"
CO C\ QP 'VQVG'F GUVCEMGT'CPF"
NKHV'WP KV"
UV5742"
-ÁUwcpf ctf 'CTUCY 'I GP '702'"
"
HTQO "
"
F GO CVKE'EQTRQTCVIQP"
"
838/; 35/8862'Rj qpg"
838/; 35/7295'Hz"
"
CPF"
"
Eqpxg{ qt 'Eqpegr w'qh'O kej li cp'NNE"
965'O ckp'Utggyv"
Eqqr gt uxkng.'O kej li cp'6; 626"
"
838/; ; 9/7422'Rj qpg"
838/; ; 9/7423'Hz"
"
Tgxkdkqp<23"
F c vgf <3444B9"

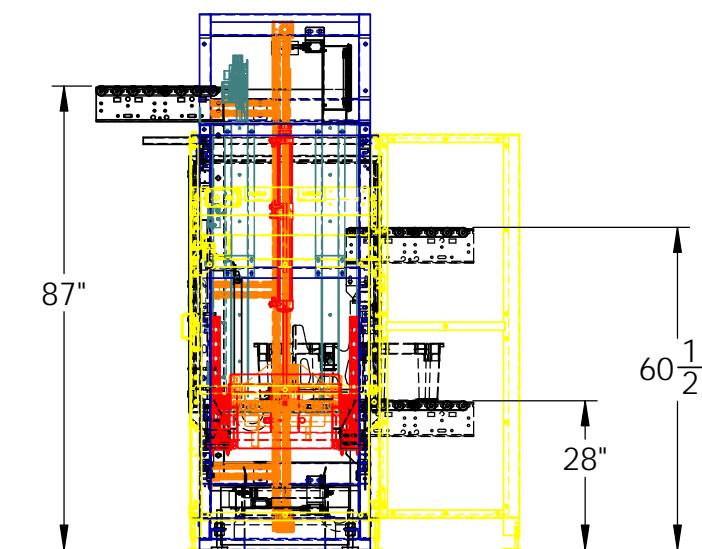
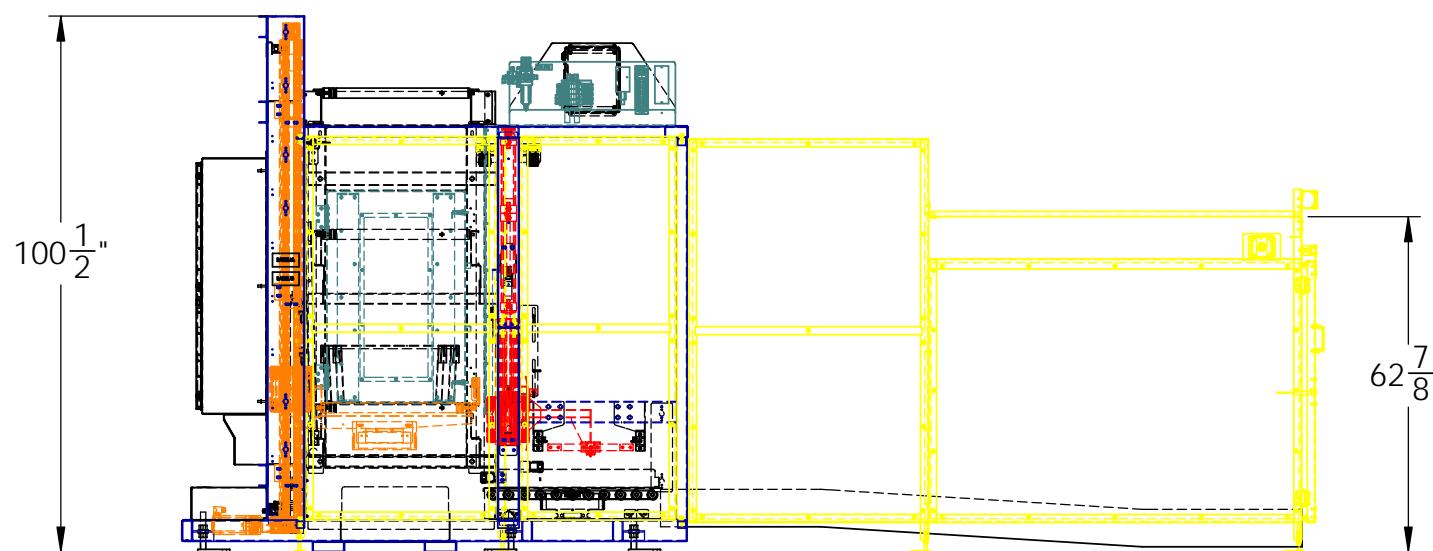
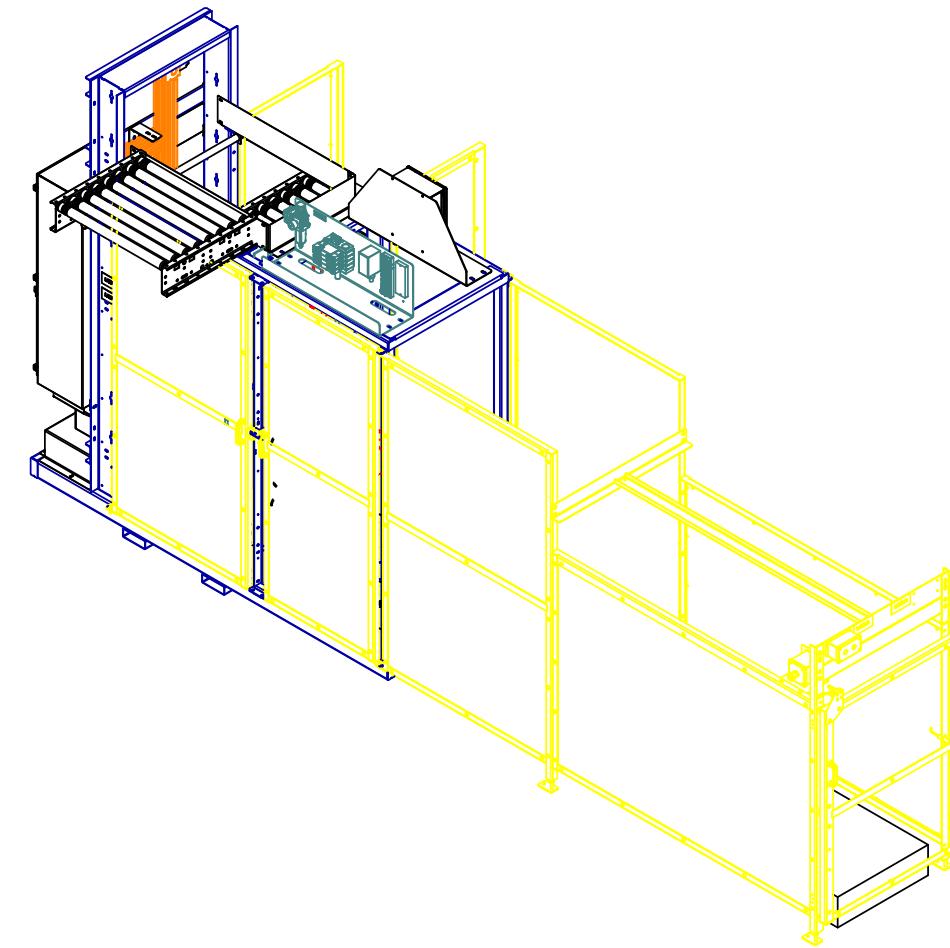
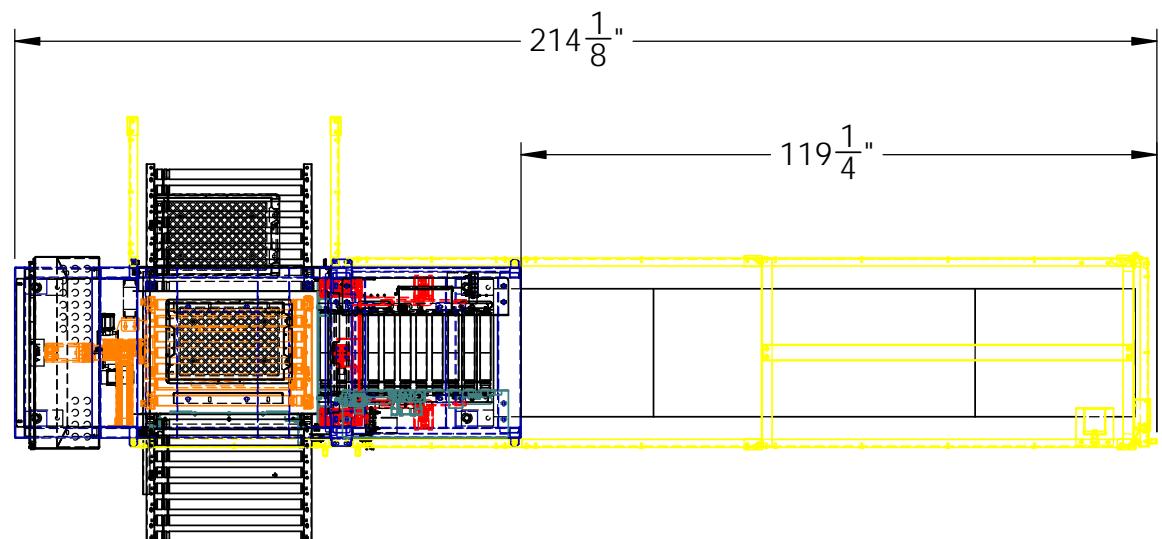
卷之三

CO C\ QP 'VQVG'F GUVCEMGT'CP F "
NHV'WP KV"
UV5742"
/Ucpf ctf 'CTUCY 'I GP "7Q/"

二〇四

CUUGO DN| 'FTCY KPI U'

110



ASSEMBLY:
P1
P2
P3
P4
P5
P6
P7
P8

DESTINATION: SHIPPING

Conveyor Concepts
OF MICHIGAN, L.L.C.

PAINT COLOR: GRAY 7035

QTY: JOB #:

ASSEMBLY - AMAZON GEN 5
LIFT/DESTACKER (RH)

REV. DWG. NO.

ST3520-A001

WEIGHT: LBS

DATE: 7/26/17

DRAWN BY: JVM 1:36 1 OF 9

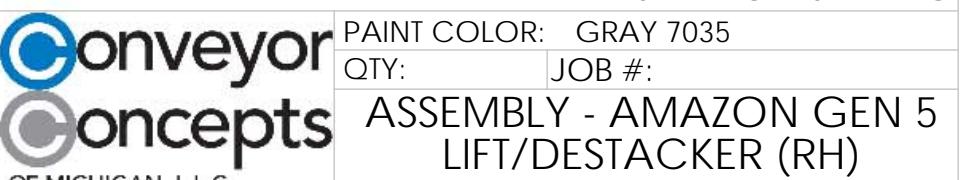
CONFIDENTIAL AND PROPRIETARY
NOTICE: THIS DRAWING AND THE INFORMATION SHOWN
ARE THE PROPERTY OF CONVEYOR CONCEPTS OF
MICHIGAN, LLC. WRITTEN PERMISSION IS REQUIRED
TO REPRODUCE THIS DRAWING OR ANY PART OF IT,
OR TO MANUFACTURE THE ITEMS DEPICTED.

ITEM	QTY	PART#	DESCRIPTION	MATERIAL TYPE
1	1	225-XL	GRIPPER CLIP 1 TO 1-3/8" DIA.	PURCHASE
2	1	A1210CH	HOFFMAN ENCLOSURE 12" X 10" X 8"	BY OTHERS
3	1	A483612LP	PANEL 48 X 36, A483612LP	BY OTHERS
4	4	Allen Bradley - 42EF-P2MPB-F4	PHOTO EYE, ALLEN BRADLEY RIGHT SIGHT 42EF-P2MPB-F4	BY OTHERS
5	4	CAL2-1032-225	RIV NUT, #CAL2-1032-225, 10-32 THREAD	PURCHASE
6	5	CHR930001	WARNING LABEL, EXPOSED MOVING PARTS CAN CAUSE SEVERE INJURY	PURCHASE
7	2	CHR930002	WARNING LABEL, EQUIPMENT STARTS AUTOMATICALLY	PURCHASE
8	1	CHS950022	WARNING LABEL, SERVICING WHILE PRESSURIZED CAN CAUSE SEVERE INJURY	PURCHASE
9	1	CL-6-DEP-2.75-C	ALIGNMENT PIN, 3/8" DIA. x 2-3/4" USABLE LENGTH, W/ LANYARD, #CL-6-DEP-2.75-C	PURCHASE
10	12	FW_1-SAE	FLAT WASHER, 1" SAE, ZP, G5	FASTENER
11	12	HN_1-8_ZP_G5	HEX NUT, 1"-8 UNC, ZP, G5	FASTENER
12	1	HU361	HU361, SQUARE D EXTERNAL DISCONNECT	BY OTHERS
13	1	K0150-3602	DISCONNECT SWITCH MOUNT, K0150-3602	BY OTHERS
14	1	Lift Energy Chain - Z16.4.040	IGUS Z16.4.040 ENERGY CHAIN x 55" O.A.L. w/ POLYMER MOUNTING BRACKETS "PIVOTING STANDARD" BOTH ENDS	BY OTHERS
15	3	PS-12MM- AB 872C-D4NP12-D4	PROX SWITCH, 12mm, PNP, 24VDC, UNSHELDDED, #AB 872C-D4NP12-D4, 4MM MICRO	BY OTHERS
16	3	SQ D LS - ZCKJKEQ3648G2	SQUARE D LIIMIT SWITCH	BY OTHERS
17	1	ST3520-A003	ASSEMBLY - MDR INFEED CONVEYOR	ASSEMBLY
18	1	ST3520-A004	ASSEMBLY - DESTACKER	ASSEMBLY
19	1	ST3520-A005	ASSEMBLY - LIFT MDR	ASSEMBLY
20	1	ST3520-A011	ASSEMBLY - VALVE BANK	ASSEMBLY
21	2	ST3520-A021	ASSEMBLY - DESTACKER HOLD DOWN ARM, NP08-15-0070	OUTSOURCE
22	1	ST3520-A025	ASSEMBLY - BLOCKER PANEL	ASSEMBLY
23	1	ST3520-A307	ASSEMBLY - DOOR FENCE PANEL X 30 7/8"	ASSEMBLY
24	1	ST3520-A308	ASSEMBLY - DOOR FENCE PANEL X 37 3/8"	ASSEMBLY
25	1	ST3520-A309	ASSEMBLY - FENCE PANEL X 32 1/4"	ASSEMBLY
26	1	ST3520-A405	ASSEMBLY - INFEED FENCING RH ASSEMBLY	ASSEMBLY
27	1	ST3520-A518	ASSEMBLY - ACCESS DOOR	ASSEMBLY
28	2	ST3520-D004	DETAIL - KEEPER ANGLE	OUTSOURCE
29	2	ST3520-D008	DETAIL - PALLETI CYLINDER MOUNTING BRACKET	OUTSOURCE
30	1	ST3520-D011	DETAIL - PROX MOUNTING ANGLE	OUTSOURCE
31	1	ST3520-D013	DETAIL - PHOTOSWITCH MTG ANGLE	OUTSOURCE
32	1	ST3520-D014	DETAIL - REFLECTOR MTG ANGLE	OUTSOURCE
33	1	ST3520-D025	DETAIL - LIMIT SWITCH MTG. PLATE	OUTSOURCE
34	1	ST3520-D026	DETAIL - LIMIT SWITCH MTG. PLATE	OUTSOURCE
35	2	ST3520-D027	DETAIL - CONVEYOR MOUNTING ANGLE	OUTSOURCE
36	4	ST3520-D047	DETAIL - CONVEYOR MOUNTING SHIM, 10GA	OUTSOURCE

ITEM	QTY	PART#	DESCRIPTION	MATERIAL TYPE
37	2	ST3520-D048	DETAIL - CONVEYOR MOUNTING SHIM 16GA	OUTSOURCE
38	1	ST3520-D050	DETAIL - LIMIT SWITCH MTG. PLATE	OUTSOURCE
39	1	ST3520-D066	DETAIL - JUNCTION BOX MOUNTING PLATE	OUTSOURCE
40	4	ST3520-D100	DETAIL - 14GA CROSMEMBER SHIM	OUTSOURCE
41	2	ST3520-D128	DETAIL - LATCH MTG ANGLE	OUTSOURCE
42	4	ST3520-D162	DETAIL - 12GA CROSMEMBER SHIM	OUTSOURCE
43	4	ST3520-D163	DETAIL - 20GA CROSMEMBER SHIM	OUTSOURCE
44	1	ST3520-D303	DETAIL - LIFT GUARD, TOP	OUTSOURCE
45	1	ST3520-D306	DETAIL - TOP LEVEL CONVEYOR GUARD	OUTSOURCE
46	1	ST3520-D352	DETAIL - TOP GUARD	OUTSOURCE
47	1	ST3520-D353	DETAIL - TOP LEVEL CONVEYOR GUARD	OUTSOURCE
48	1	ST3520-D502	DETAIL - BOTTOM SIDE GUARD	OUTSOURCE
49	1	ST3520-D513	DETAIL - BACKSTOP RAIL	OUTSOURCE
50	2	ST3520-D527	DETAIL - CONVEYOR MOUNTING ANGLE EXTENDED	OUTSOURCE
51	2	ST3520-D528	DETAIL - JAM DETECTION PE/REFLECTOR MOUNT	OUTSOURCE
52	1	ST3520-D534	DETAIL - LOCKOUT PIPE CHANNEL MOUNT	OUTSOURCE
53	2	ST3520-D535	DETAIL - LOCK OUT PIPE	STEEL
54	1	ST3520-D536	DETAIL - BACKSTOP RAIL	OUTSOURCE
55	1	ST3520-D546	DETAIL - LIFT GUARD, TOP	OUTSOURCE
56	1	ST3520-D547	DETAIL - LOCKOUT PIPE PIN MOUNT	OUTSOURCE
57	1	ST3520-D548	DETAIL - OVERSTACK PHOTOEYE BRACKET	OUTSOURCE
58	1	ST3520-D549	DETAIL - OVERSTACK REFLECTOR BRACKET RH	OUTSOURCE
59	1	ST3520-D550	DETAIL - JUNCTION BOX MOUNTING ANGLE	OUTSOURCE
60	1	ST3520-D552	DETAIL - LOCKOUT PIPE RETAINER	OUTSOURCE
61	1	ST3520-W012	WELDMENT - CAT TRACK BRACKET	OUTSOURCE
62	2	ST3520-W014	WELDMENT - FRAME CROSMEMBER/CONVEYOR MT.	WELDMENT
63	2	ST3520-W020	WELDMENT - BACKSTOP MTG CROSMEMBER	WELDMENT
64	2	ST3520-W027	WELDMENT - STRIPPER CYLINDER MOUNT	OUTSOURCE
65	2	ST3520-W033	WELDMENT - INFEED GUIDE	OUTSOURCE
66	6	ST3520-W034	WELDMENT - THREADED FOOT (1"-8)	OUTSOURCE
67	2	ST3520-W035	WELDMENT - BACKSTOP TOP AND BOTTOM PAN	OUTSOURCE
68	1	ST3520-W036	WELDMENT - SERVO MOTOR GUARD	OUTSOURCE
69	1	ST3520-W518	WELDMENT - FRAME LIFT/DESTACKER	WELDMENT
70	1	ST3520-W530	WELDMENT - GENERATION 5 PANEL BOTTOM GUARD	OUTSOURCE
71	1	Series 200 Energy Chain Cylinder	SERIES 200 ENERGY CHAIN x 40-1/2" O.A.L. w/ POLYMER MOUNTING BRACKETS "PIVOTING STANDARD" BOTH ENDS	BY OTHERS
72	4	Sick 101270	REFLECTOR, SICK 101270	BY OTHERS

ASSEMBLY:P1
:P2
:P3
:P4
:P5
:P6
:P7
:P8

DESTINATION: SHIPPING



PAINT COLOR: GRAY 7035

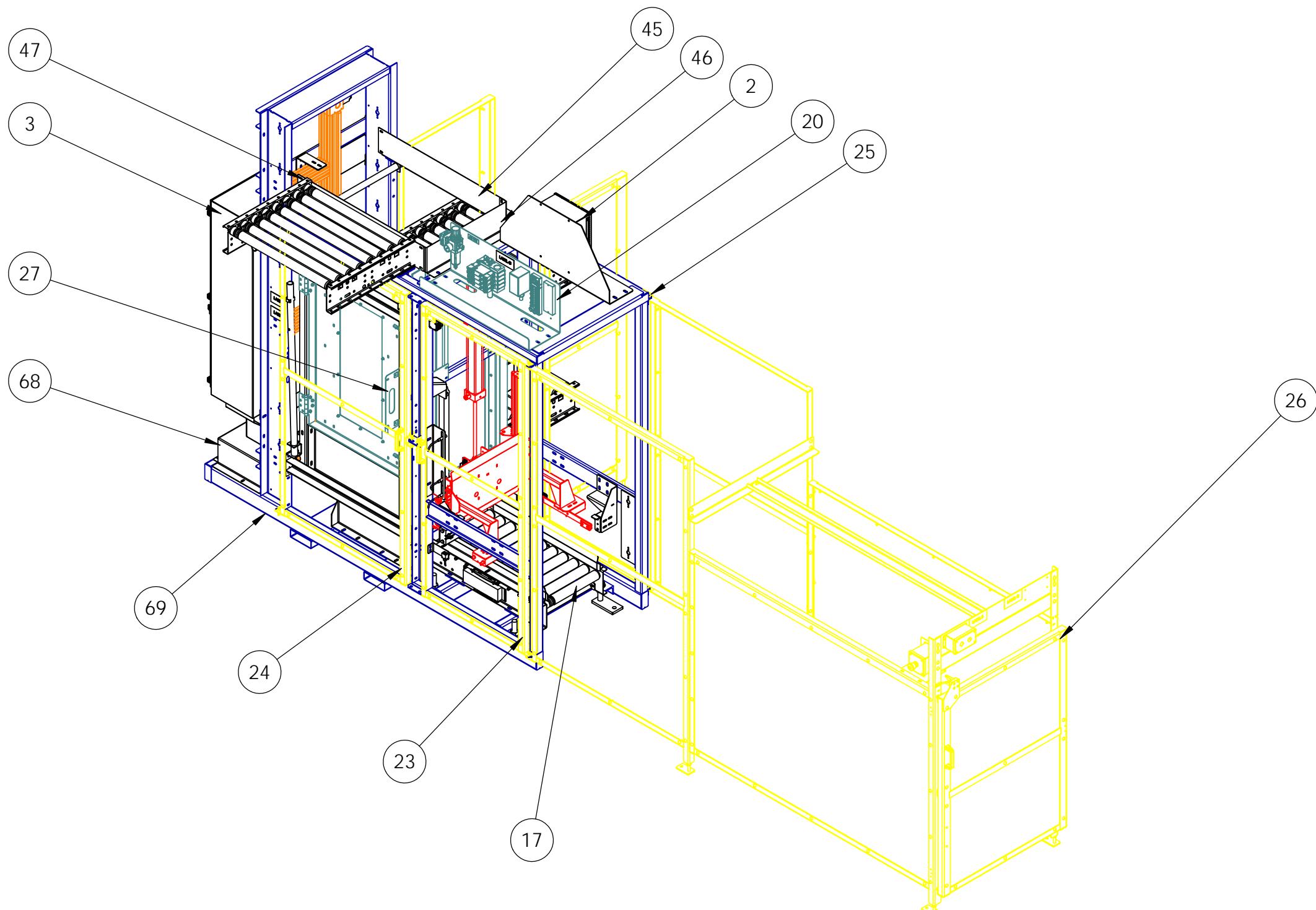
QTY: JOB #:

ASSEMBLY - AMAZON GEN 5
LIFT/DESTACKER (RH)

REV. DWG. NO. ST3520-A001
DATE: 7/26/17 DRAWN BY: JVM 1:48 2 OF 9

WEIGHT: LBS

CONFIDENTIAL AND PROPRIETARY
NOTICE: This drawing and the design shown
are the property of CONVEYOR CONCEPTS OF
MICHIGAN, LLC. WRITTEN PERMISSION IS REQUIRED
TO REPRODUCE THIS DRAWING OR ANY PART OF IT,
OR TO MANUFACTURE THE ITEMS DEPICTED.



ASSEMBLY:P1
:P2
:P3
:P4
:P5
:P6
:P7
:P8

DESTINATION: SHIPPING



PAINT COLOR: GRAY 7035

QTY: JOB #:

ASSEMBLY - AMAZON GEN 5
LIFT/DESTACKER (RH)

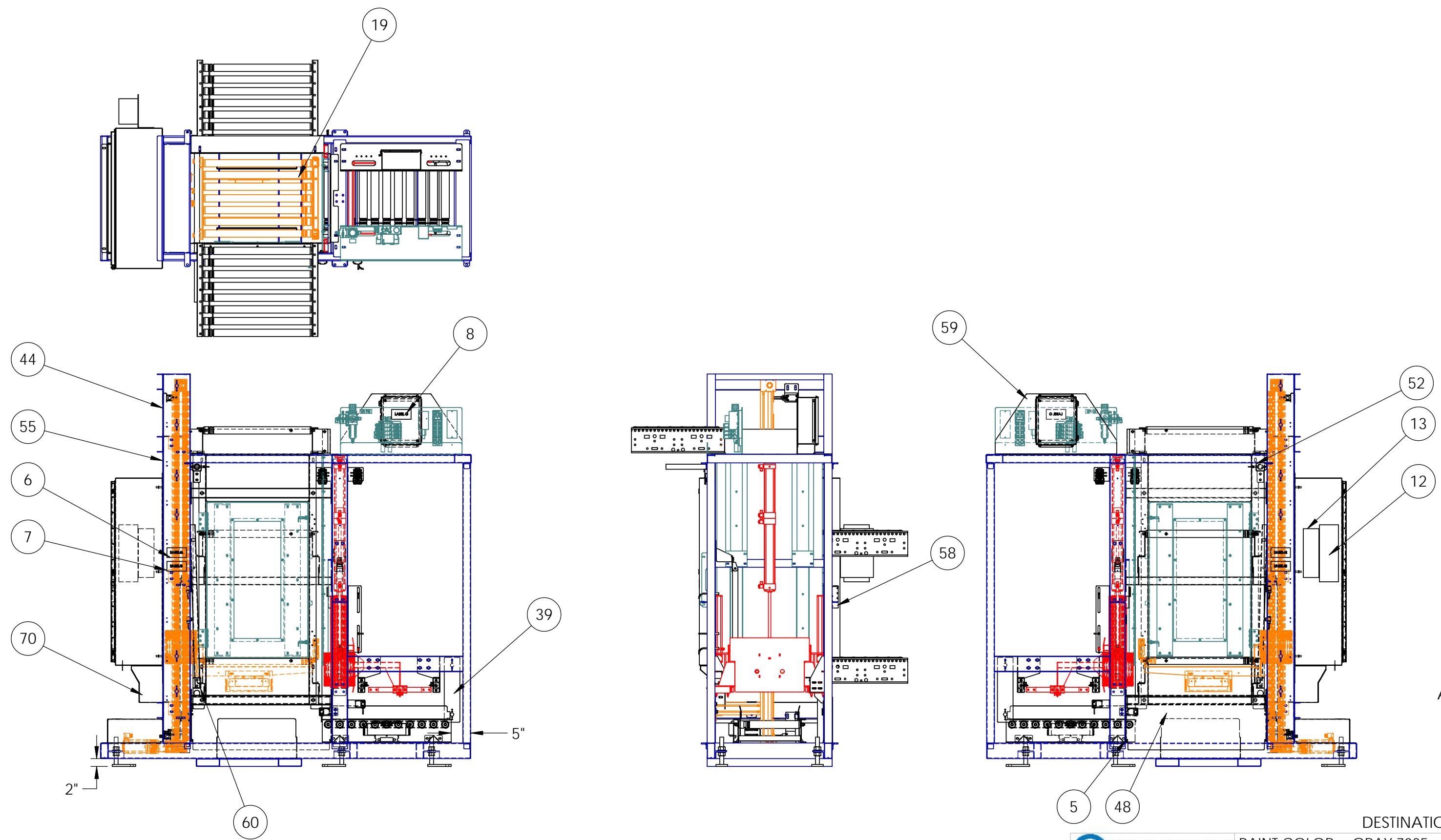
REV. DWG. NO.

ST3520-A001

WEIGHT: LBS

DATE: 7/26/17 DRAWN BY: JVM 1:24 3 OF 9

CONFIDENTIAL AND PROPRIETARY
NOTE: THIS DRAWING AND THE ITEMS SHOWN
ARE THE PROPERTY OF CONVEYOR CONCEPTS OF
MICHIGAN, LLC. WRITTEN PERMISSION IS REQUIRED
TO REPRODUCE THIS DRAWING OR ANY PART OF IT,
OR TO MANUFACTURE THE ITEMS DEPICTED.



ASSEMBLY:
P1
P2
P3
P4
P5
P6
P7
P8

DESTINATION: SHIPPING

**Conveyor
Concepts**
OF MICHIGAN, L.L.C.

PAINT COLOR: GRAY 7035

QTY: JOB #:

ASSEMBLY - AMAZON GEN 5
LIFT/DESTACKER (RH)

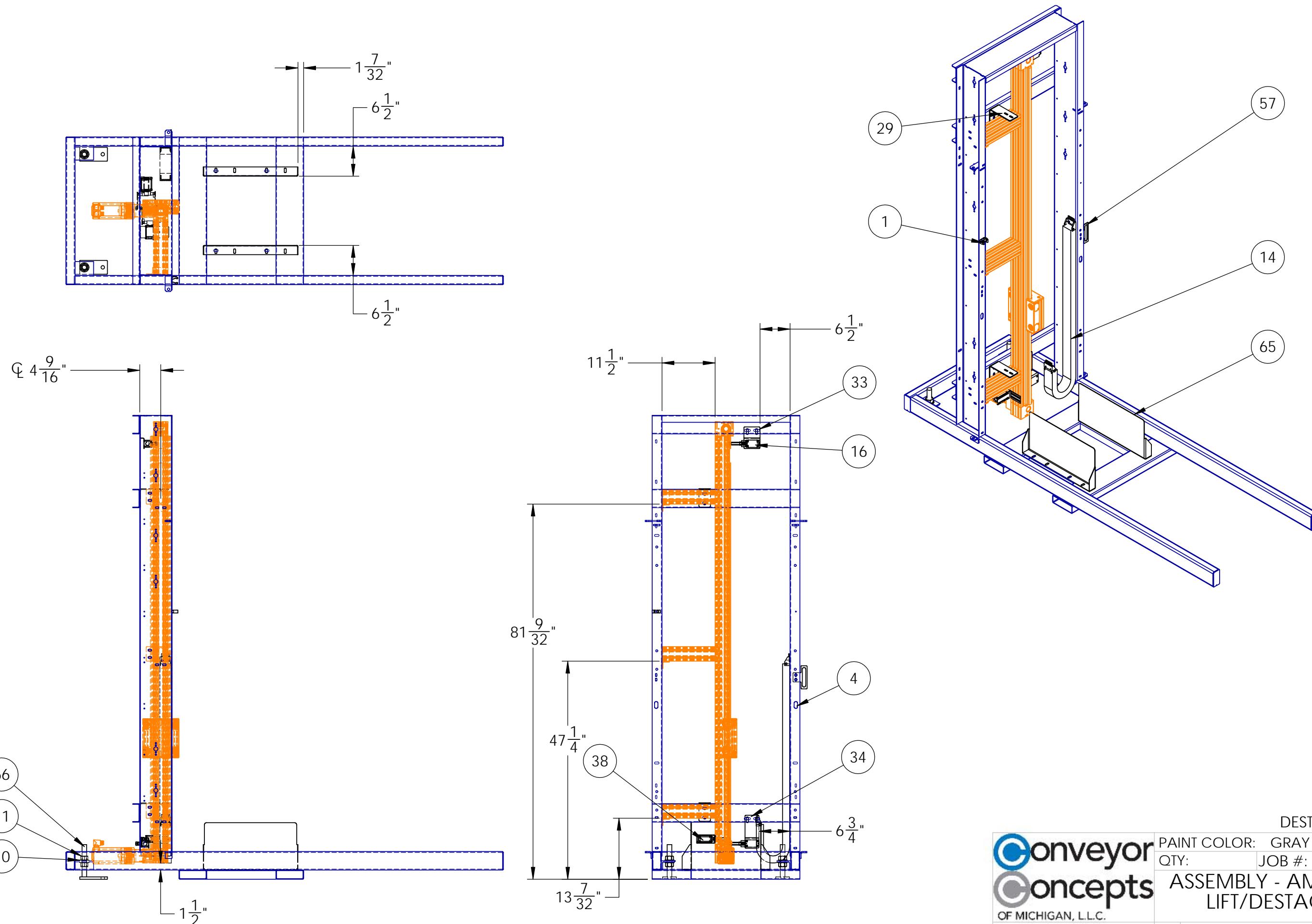
REV. DWG. NO.

ST3520-A001

WEIGHT: LBS

DATE: 7/26/17 DRAWN BY: JVM 1:24 4 OF 9

CONFIDENTIAL AND PROPRIETARY
NOTE: THIS DRAWING AND THE DESIGN SHOWN
ARE THE PROPERTY OF CONVEYOR CONCEPTS OF
MICHIGAN, LLC. WRITTEN PERMISSION IS REQUIRED
TO REPRODUCE THIS DRAWING OR ANY PART OF IT,
OR TO MANUFACTURE THE ITEMS DEPICTED.



ASSEMBLY:P1
P2
P3
P4
P5
P6
P7
P8

DESTINATION: SHIPPING

PAINT COLOR: GRAY 7035
QTY: JOB #:

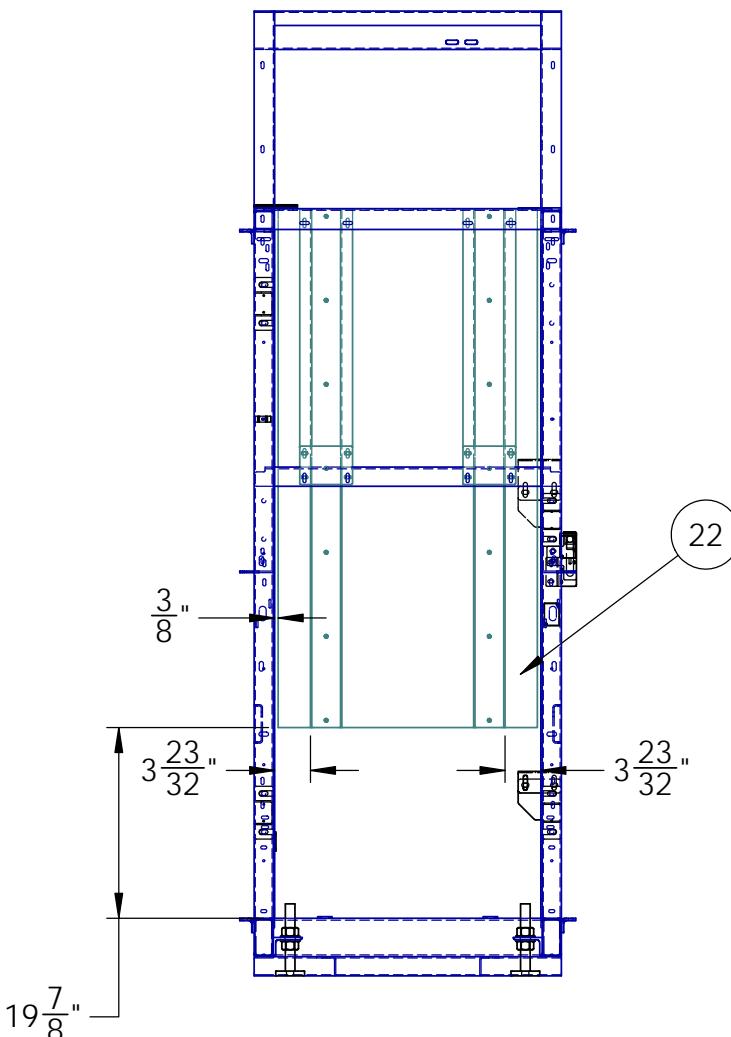
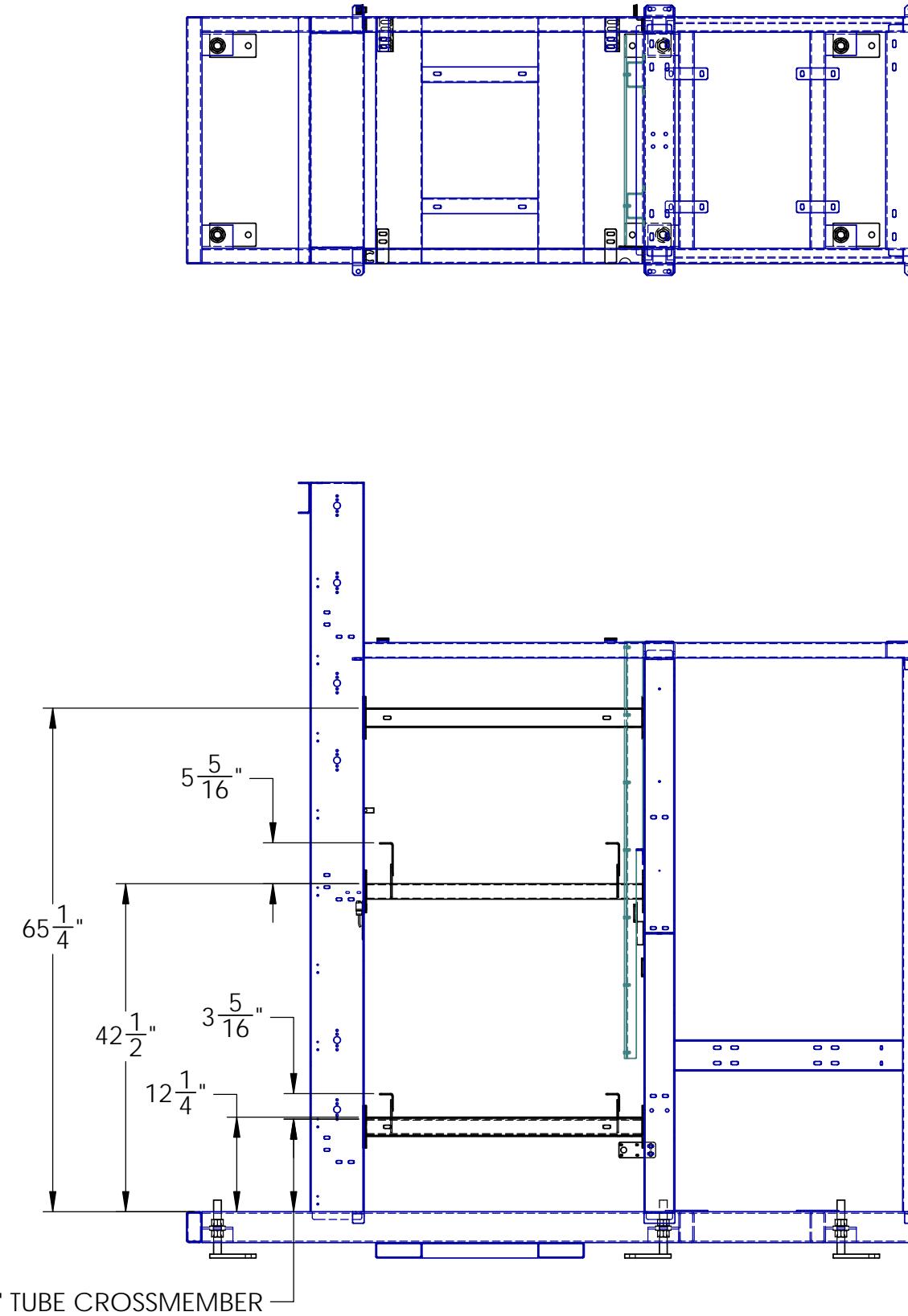
ASSEMBLY - AMAZON GEN 5
LIFT/DESTACKER (RH)

Conveyor Concepts
OF MICHIGAN, L.L.C.

CONFIDENTIAL AND PROPRIETARY
NOTICE: THIS DRAWING AND THE INFORMATION SHOWN
ARE THE PROPERTY OF CONVEYOR CONCEPTS OF
MICHIGAN, LLC. WRITTEN PERMISSION IS REQUIRED
TO REPRODUCE THIS DRAWING OR ANY PART OF IT,
OR TO MANUFACTURE THE ITEMS DEPICTED.

WEIGHT: LBS

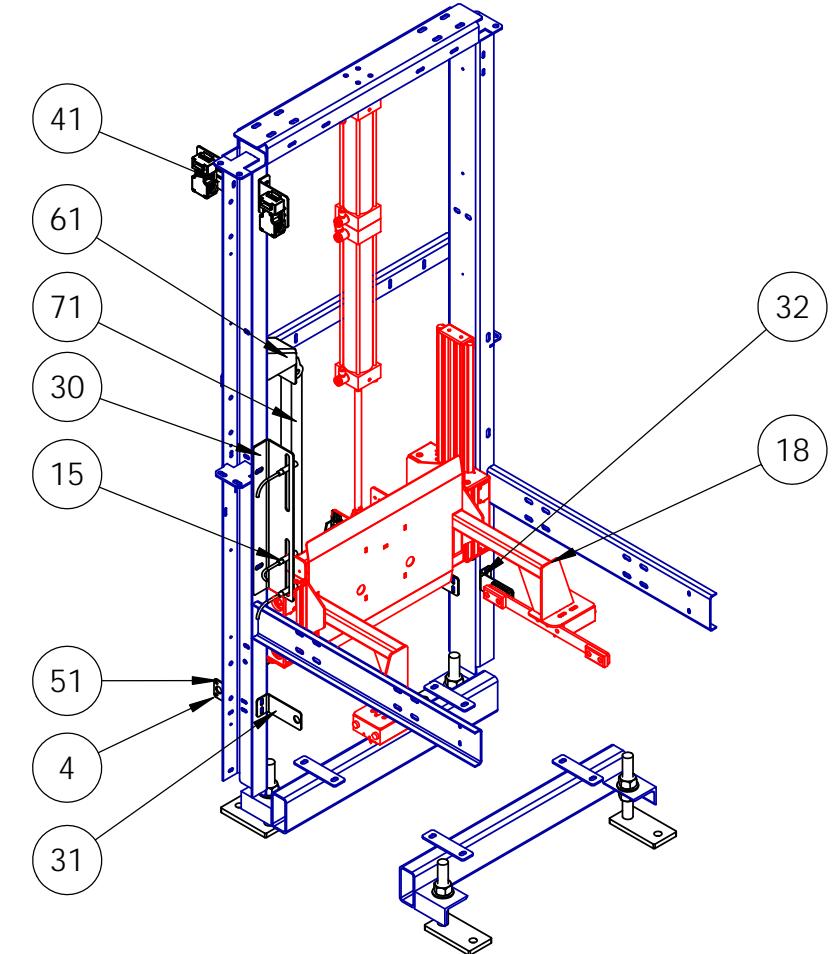
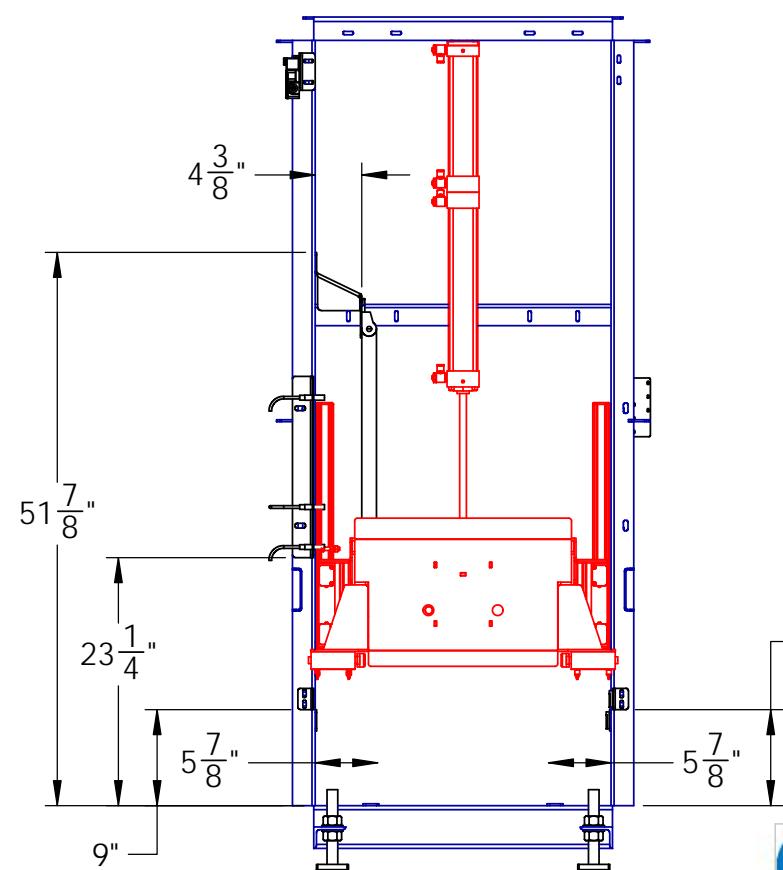
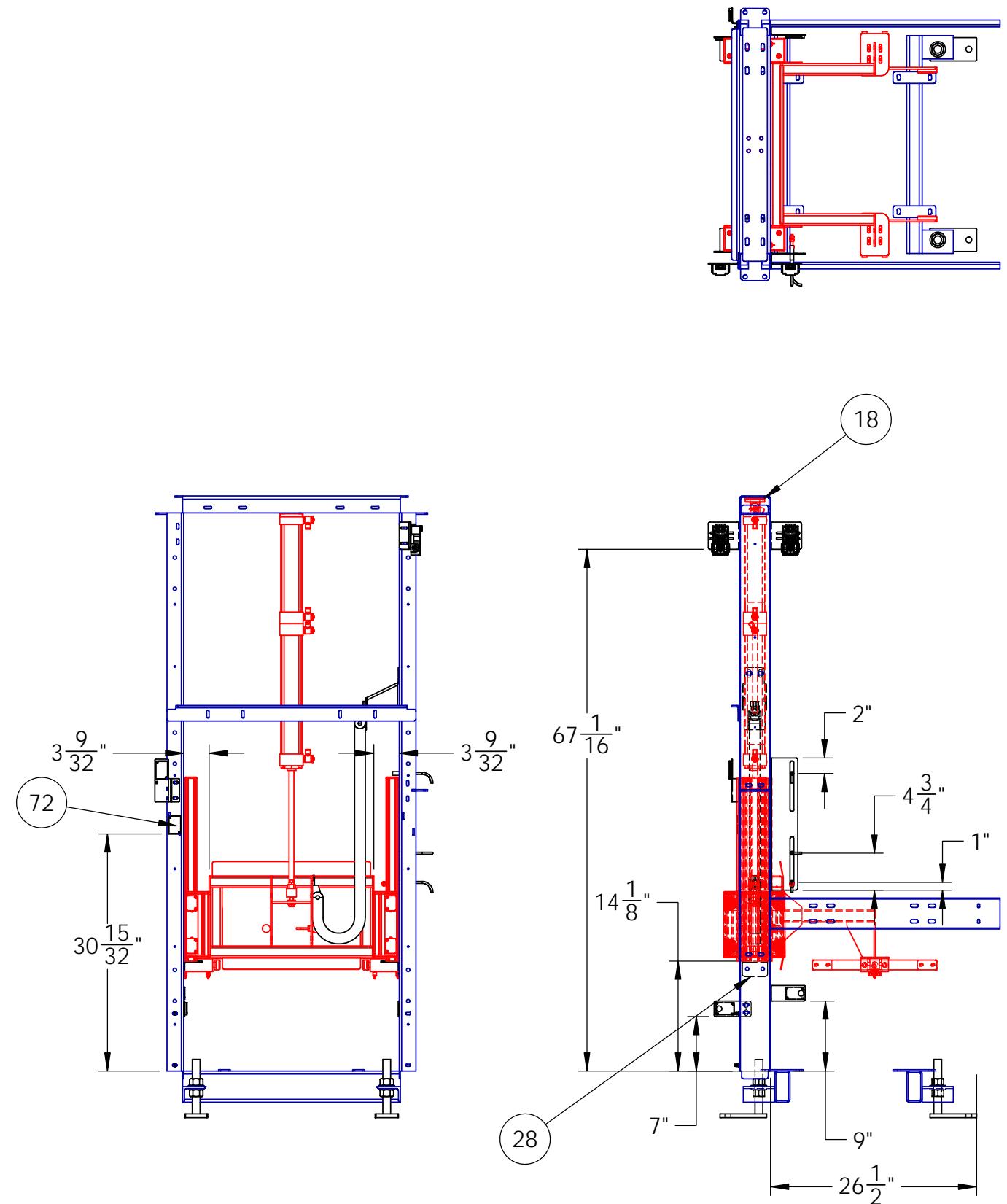
REV.	DWG. NO.
ST3520-A001	
DATE: 7/26/17	DRAWN BY: JVM 1:20 5 OF 9



CONFIDENTIAL AND PROPRIETARY
NOTE: THIS DRAWING AND THE DESIGN SHOWN
ARE THE PROPERTY OF CONVEYOR CONCEPTS OF
MICHIGAN, LLC. WRITTEN PERMISSION IS REQUIRED
TO REPRODUCE THIS DRAWING OR ANY PART OF IT,
OR TO MANUFACTURE THE ITEMS DEPICTED.

DESTINATION: SHIPPING
PAINT COLOR: GRAY 7035
QTY: JOB #:
**ASSEMBLY - AMAZON GEN 5
LIFT/DESTACKER (RH)**

REV.	DWG. NO.		
	ST3520-A001		
DATE: 7/26/17	DRAWN BY: JVM	1:20	6 OF 9



ASSEMBLY: P1
P2
P3
P4
P5
P6
P7
P8

DESTINATION: SHIPPING

PAINT COLOR: GRAY 7035

QTY: JOB #:

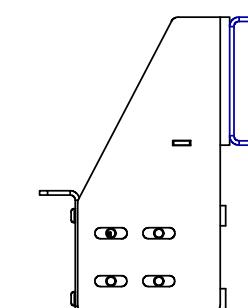
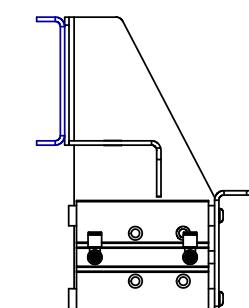
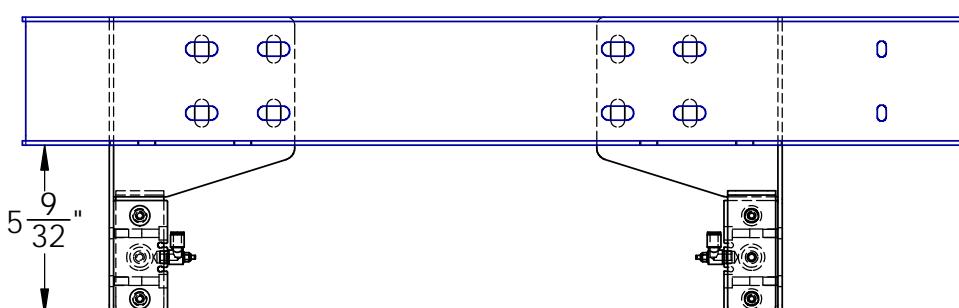
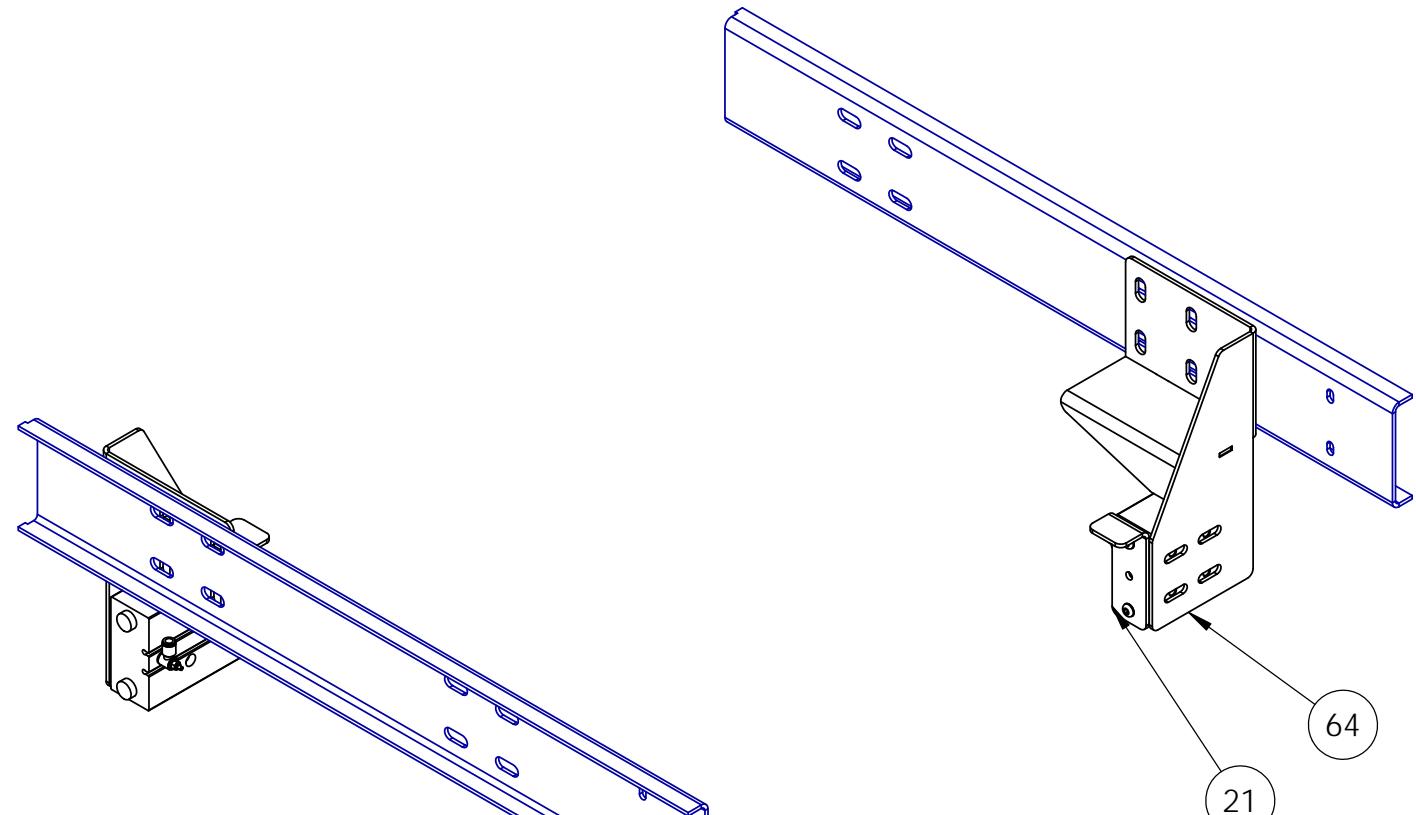
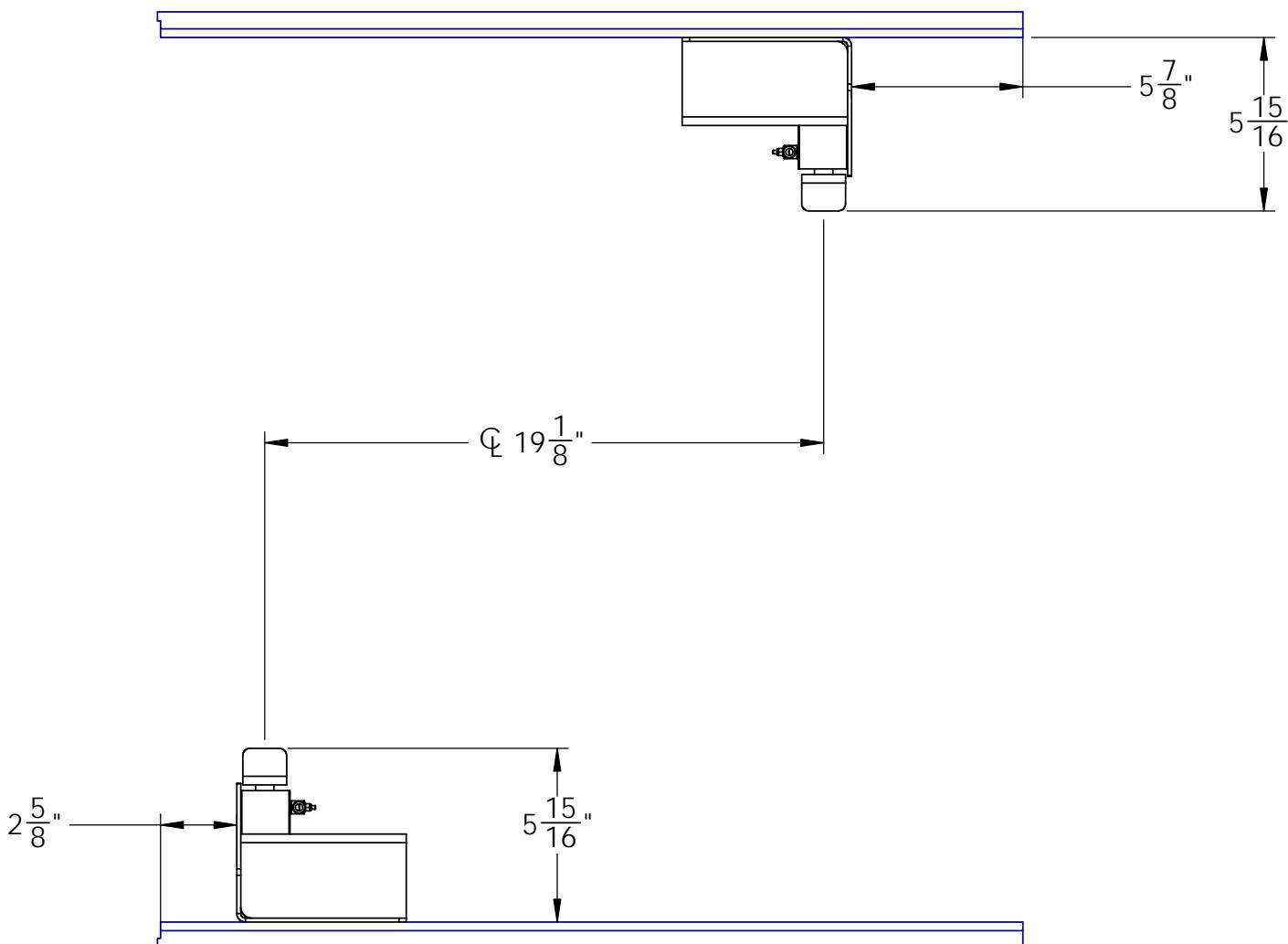
ASSEMBLY - AMAZON GEN 5
LIFT/DESTACKER (RH)

Conveyor Concepts
OF MICHIGAN, L.L.C.

CONFIDENTIAL AND PROPRIETARY
NOTICE: THIS DRAWING AND THE INFORMATION SHOWN
ARE THE PROPERTY OF CONVEYOR CONCEPTS OF
MICHIGAN, LLC. WRITTEN PERMISSION IS REQUIRED
TO REPRODUCE THIS DRAWING OR ANY PART OF IT,
OR TO MANUFACTURE THE ITEMS DEPICTED.

WEIGHT: LBS

REV.	DWG. NO.
ST3520-A001	
DATE: 7/26/17	DRAWN BY: JVM 1:18 7 OF 9



ASSEMBLY:
P1
P2
P3
P4
P5
P6
P7
P8

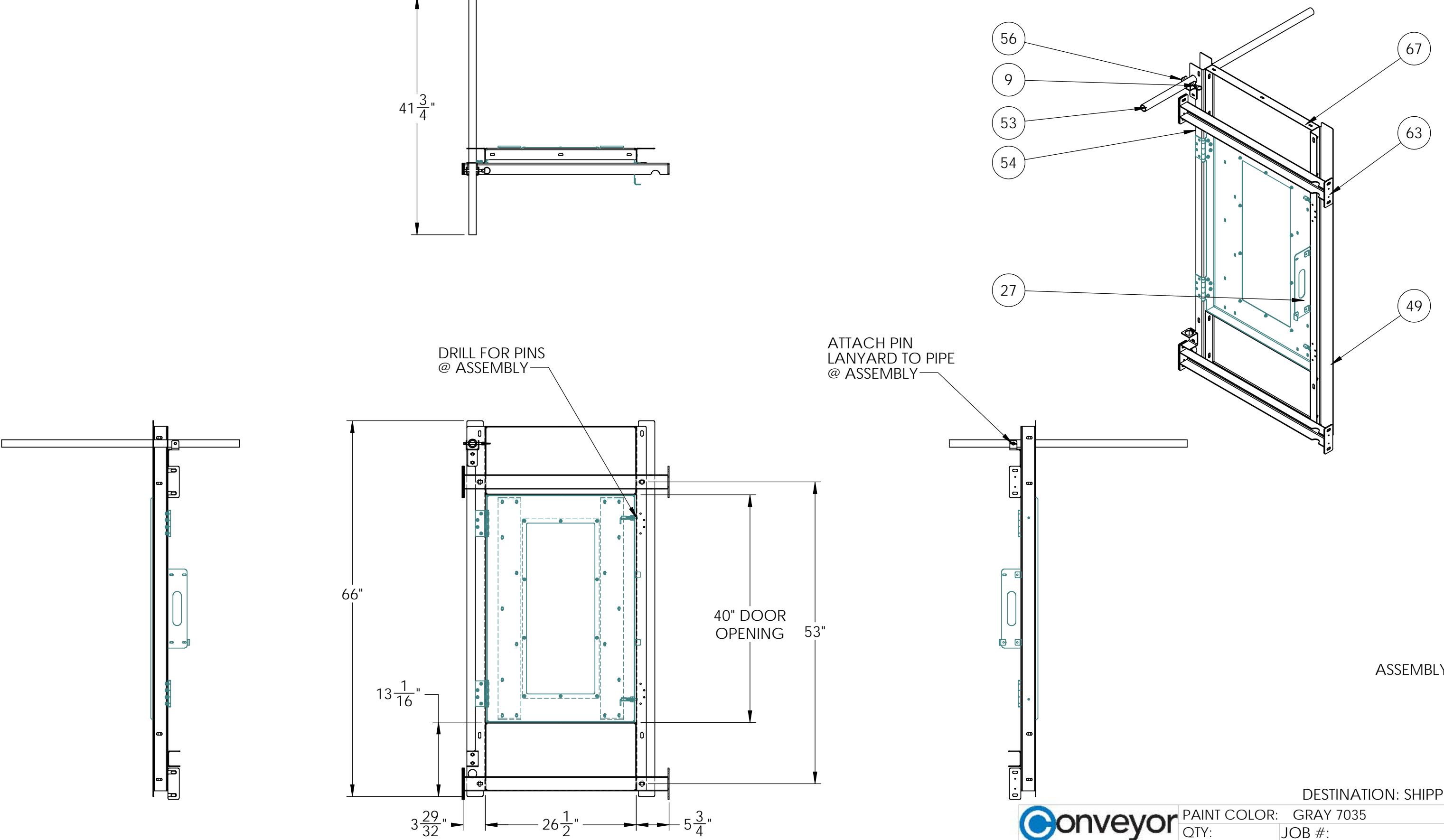
DESTINATION: SHIPPING

**Conveyor
Concepts**
OF MICHIGAN, L.L.C.

PAINT COLOR:	GRAY 7035
QTY:	JOB #:
ASSEMBLY - AMAZON GEN 5 LIFT/DESTACKER (RH)	
REV.:	DWG. NO.
ST3520-A001	
DATE: 7/26/17	DRAWN BY: JVM 1:6 8 OF 9

WEIGHT: LBS

CONFIDENTIAL AND PROPRIETARY
NOTE: THIS DRAWING AND THE ITEMS SHOWN
ARE THE PROPERTY OF CONVEYOR CONCEPTS OF
MICHIGAN, LLC. WRITTEN PERMISSION IS REQUIRED
TO REPRODUCE THIS DRAWING OR ANY PART OF IT,
OR TO MANUFACTURE THE ITEMS DEPICTED.

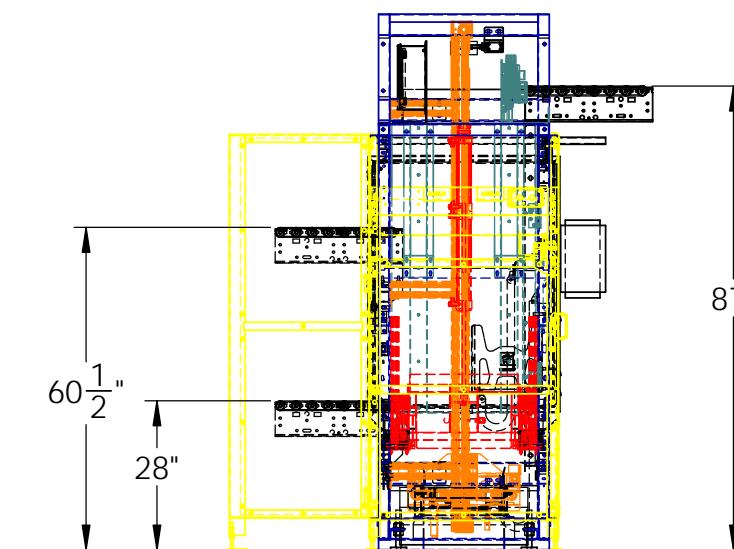
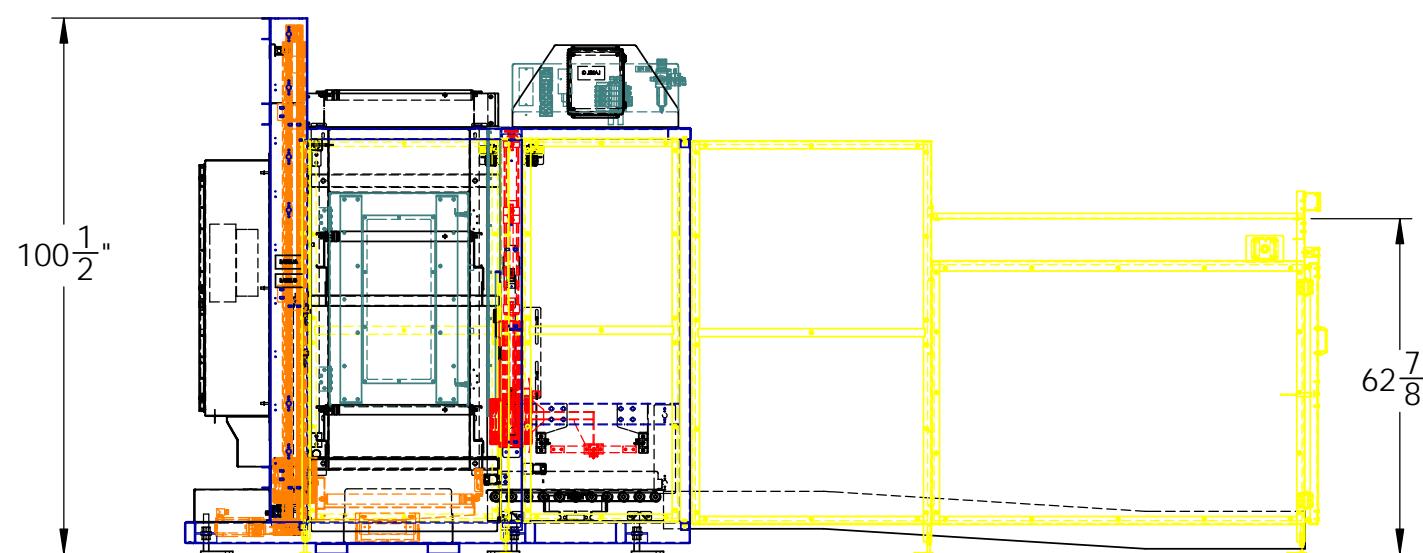
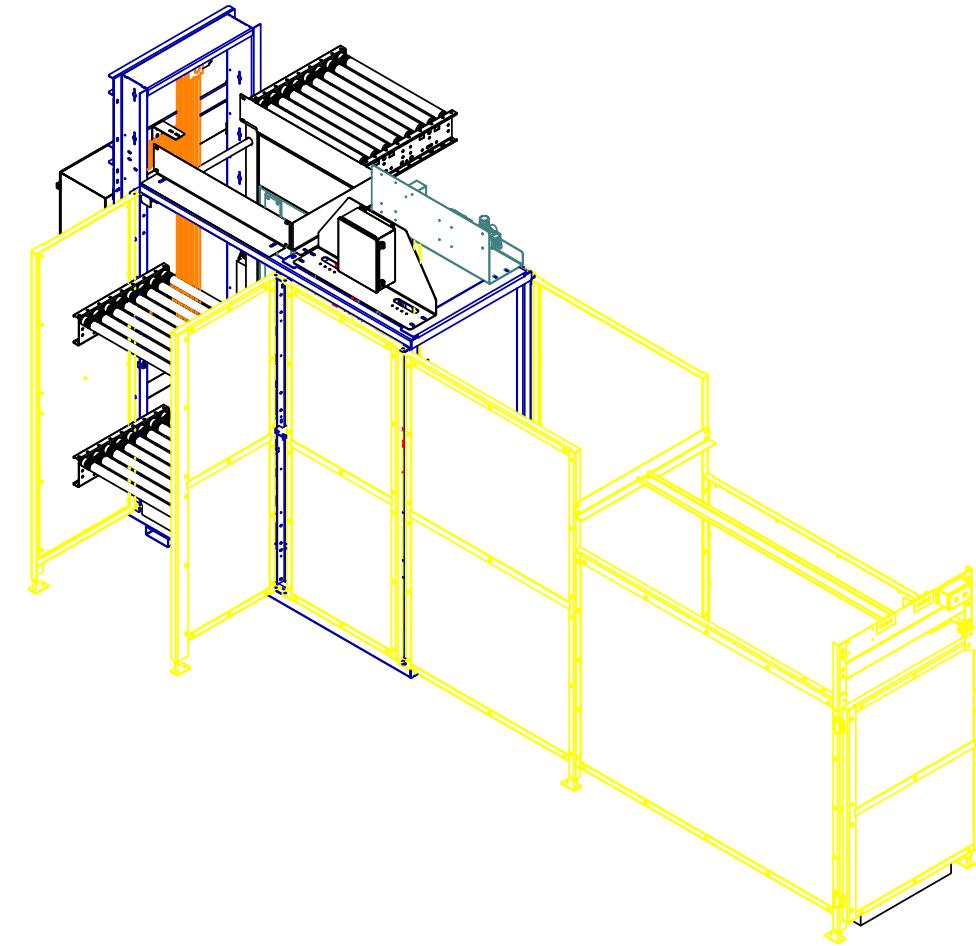
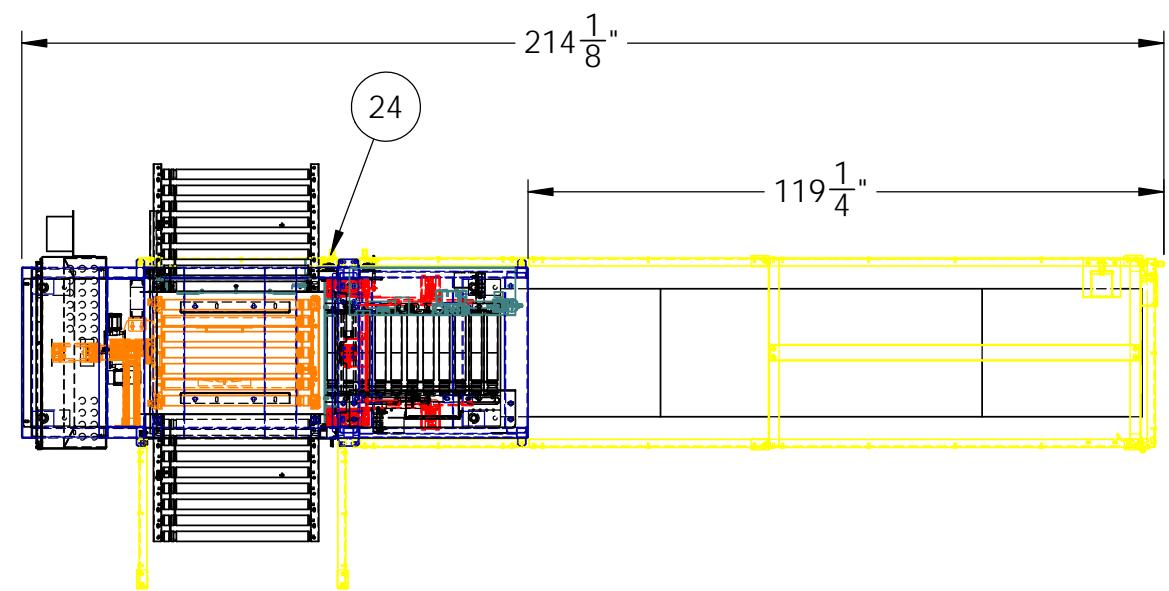


**Conveyor
Concepts**
OF MICHIGAN, L.L.C.

CONFIDENTIAL AND PROPRIETARY
NOTE: THIS DRAWING AND THE ITEM SHOWN
ARE THE PROPERTY OF CONVEYOR CONCEPTS OF
MICHIGAN, LLC. WRITTEN PERMISSION IS REQUIRED
TO REPRODUCE THIS DRAWING OR ANY PART OF IT,
OR TO MANUFACTURE THE ITEMS DEPICTED.

PAINT COLOR:	GRAY 7035
QTY:	JOB #:
ASSEMBLY - AMAZON GEN 5 LIFT/DESTACKER (RH)	
REV.	DWG. NO.
ST3520-A001	
DATE: 7/26/17	DRAWN BY: JVM 1:16 9 OF 9

WEIGHT: LBS



ASSEMBLY:
P1
P2
P3
P4
P5
P6
P7
P8

DESTINATION: SHIPPING



PAINT COLOR: GRAY 7035

QTY: JOB #:

ASSEMBLY - AMAZON GEN 5
LIFT/DESTACKER (LH)

REV. DWG. NO.

ST3520-A002

WEIGHT: LBS

DATE: 7/26/17 DRAWN BY: JVM 1:36 1 OF 9

CONFIDENTIAL AND PROPRIETARY
NOTICE: THIS DRAWING AND THE INFORMATION SHOWN
ARE THE PROPERTY OF CONVEYOR CONCEPTS OF
MICHIGAN, LLC. WRITTEN PERMISSION IS REQUIRED
TO REPRODUCE THIS DRAWING OR ANY PART OF IT,
OR TO MANUFACTURE THE ITEMS DEPICTED.

ITEM	QTY	PART#	DESCRIPTION	MATERIAL TYPE
1	1	225-XL	GRIPPER CLIP 1 TO 1-3/8" DIA.	PURCHASE
2	1	A1210CH	HOFFMAN ENCLOSURE 12" X 10" X 8"	BY OTHERS
3	1	A483612LP	PANEL 48 X 36, A483612LP	BY OTHERS
4	4	Allen Bradley - 42EF-P2MPB-F4	PHOTO EYE, ALLEN BRADLEY RIGHT SIGHT 42EF-P2MPB-F4	BY OTHERS
5	4	CAL2-1032-225	RIV NUT, #CAL2-1032-225, 10-32 THREAD	PURCHASE
6	5	CHR930001	WARNING LABEL, EXPOSED MOVING PARTS CAN CAUSE SEVERE INJURY	PURCHASE
7	2	CHR930002	WARNING LABEL, EQUIPMENT STARTS AUTOMATICALLY	PURCHASE
8	1	CHS950022	WARNING LABEL, SERVICING WHILE PRESSURIZED CAN CAUSE SEVERE INJURY	PURCHASE
9	1	CL-6-DEP-2.75-C	ALIGNMENT PIN, 3/8" DIA. x 2-3/4" USABLE LENGTH, W/ LANYARD, #CL-6-DEP-2.75-C	PURCHASE
10	12	FW_1-SAE	FLAT WASHER, 1" SAE, ZP, G5	FASTENER
11	12	HN_1-8_ZP_G5	HEX NUT, 1"-8 UNC, ZP, G5	FASTENER
12	1	HU361	HU361, SQUARE D EXTERNAL DISCONNECT	BY OTHERS
13	1	K0150-3602	DISCONNECT SWITCH MOUNT, K0150-3602	BY OTHERS
14	1	Lift Energy Chain - Z16.4.040	IGUS Z16.4.040 ENERGY CHAIN x 55" O.A.L. w/ POLYMER MOUNTING BRACKETS "PIVOTING STANDARD" BOTH ENDS	BY OTHERS
15	3	PS-12MM- AB 872C-D4NP12-D4	PROX SWITCH, 12mm, PNP, 24VDC, UNSHEILEDDED, #AB 872C-D4NP12-D4, 4MM MICRO	BY OTHERS
16	3	SQ D LS - ZCKJKEQ3648G2	SQUARE D LIIMIT SWITCH	BY OTHERS
17	1	ST3520-A003	ASSEMBLY - MDR INFEED CONVEYOR	ASSEMBLY
18	1	ST3520-A004	ASSEMBLY - DESTACKER	ASSEMBLY
19	1	ST3520-A005	ASSEMBLY - LIFT MDR	ASSEMBLY
20	1	ST3520-A011	ASSEMBLY - VALVE BANK	ASSEMBLY
21	2	ST3520-A021	ASSEMBLY - DESTACKER HOLD DOWN ARM, NP08-15-0070	OUTSOURCE
22	1	ST3520-A025	ASSEMBLY - BLOCKER PANEL	ASSEMBLY
23	1	ST3520-A307	ASSEMBLY - DOOR FENCE PANEL X 30 7/8"	ASSEMBLY
24	1	ST3520-A308	ASSEMBLY - DOOR FENCE PANEL X 37 3/8"	ASSEMBLY
25	1	ST3520-A309	ASSEMBLY - FENCE PANEL X 32 1/4"	ASSEMBLY
26	1	ST3520-A406	ASSEMBLY - INFEED FENCING LH ASSEMBLY	ASSEMBLY
27	1	ST3520-A518	ASSEMBLY - ACCESS DOOR	ASSEMBLY
28	2	ST3520-D004	DETAIL - KEEPER ANGLE	OUTSOURCE
29	2	ST3520-D008	DETAIL - PALLETI CYLINDER MOUNTING BRACKET	OUTSOURCE
30	1	ST3520-D011	DETAIL - PROX MOUNTING ANGLE	OUTSOURCE
31	1	ST3520-D013	DETAIL - PHOTOSWITCH MTG ANGLE	OUTSOURCE
32	1	ST3520-D014	DETAIL - REFLECTOR MTG ANGLE	OUTSOURCE
33	1	ST3520-D025	DETAIL - LIMIT SWITCH MTG. PLATE	OUTSOURCE
34	1	ST3520-D026	DETAIL - LIMIT SWITCH MTG. PLATE	OUTSOURCE
35	2	ST3520-D027	DETAIL - CONVEYOR MOUNTING ANGLE	OUTSOURCE
36	4	ST3520-D047	DETAIL - CONVEYOR MOUNTING SHIM, 10GA	OUTSOURCE

ITEM	QTY	PART#	DESCRIPTION	MATERIAL TYPE
37	2	ST3520-D048	DETAIL - CONVEYOR MOUNTING SHIM 16GA	OUTSOURCE
38	1	ST3520-D050	DETAIL - LIMIT SWITCH MTG. PLATE	OUTSOURCE
39	1	ST3520-D066	DETAIL - JUNCTION BOX MOUNTING PLATE	OUTSOURCE
40	4	ST3520-D100	DETAIL - 14GA CROSSMEMBER SHIM	OUTSOURCE
41	2	ST3520-D128	DETAIL - LATCH MTG ANGLE	OUTSOURCE
42	4	ST3520-D162	DETAIL - 12GA CROSSMEMBER SHIM	OUTSOURCE
43	4	ST3520-D163	DETAIL - 20GA CROSSMEMBER SHIM	OUTSOURCE
44	1	ST3520-D303	DETAIL - LIFT GUARD, TOP	OUTSOURCE
45	1	ST3520-D306	DETAIL - TOP LEVEL CONVEYOR GUARD	OUTSOURCE
46	1	ST3520-D352	DETAIL - TOP GUARD	OUTSOURCE
47	1	ST3520-D353	DETAIL - TOP LEVEL CONVEYOR GUARD	OUTSOURCE
48	1	ST3520-D502	DETAIL - BOTTOM SIDE GUARD	OUTSOURCE
49	1	ST3520-D513	DETAIL - BACKSTOP RAIL	OUTSOURCE
50	2	ST3520-D527	DETAIL - CONVEYOR MOUNTING ANGLE EXTENDED	OUTSOURCE
51	2	ST3520-D528	DETAIL - JAM DETECTION PE/REFLECTOR MOUNT	OUTSOURCE
52	1	ST3520-D534	DETAIL - LOCKOUT PIPE CHANNEL MOUNT	OUTSOURCE
53	1	ST3520-D535	DETAIL - LOCK OUT PIPE	STEEL
54	1	ST3520-D536	DETAIL - BACKSTOP RAIL	OUTSOURCE
55	1	ST3520-D546	DETAIL - LIFT GUARD, TOP	OUTSOURCE
56	1	ST3520-D547	DETAIL - LOCKOUT PIPE PIN MOUNT	OUTSOURCE
57	1	ST3520-D548	DETAIL - OVERSTACK PHOTOEYE BRACKET	OUTSOURCE
58	1	ST3520-D550	DETAIL - JUNCTION BOX MOUNTING ANGLE	OUTSOURCE
59	1	ST3520-D551	DETAIL - OVERSTACK REFLECTOR BRACKET LH	OUTSOURCE
60	1	ST3520-D552	DETAIL - LOCKOUT PIPE RETAINER	OUTSOURCE
61	1	ST3520-W012	WELDMENT - CAT TRACK BRACKET	OUTSOURCE
62	2	ST3520-W014	WELDMENT - FRAME CROSSMEMBER/CONVEYOR MT.	WELDMENT
63	2	ST3520-W020	WELDMENT - BACKSTOP MTG CROSSMEMBER	WELDMENT
64	2	ST3520-W027	WELDMENT - STRIPPER CYLINDER MOUNT	OUTSOURCE
65	2	ST3520-W033	WELDMENT - INFEED GUIDE	OUTSOURCE
66	6	ST3520-W034	WELDMENT - THREADED FOOT (1"-8)	OUTSOURCE
67	2	ST3520-W035	WELDMENT - BACKSTOP TOP AND BOTTOM PAN	OUTSOURCE
68	1	ST3520-W036	WELDMENT - SERVO MOTOR GUARD	OUTSOURCE
69	1	ST3520-W518	WELDMENT - FRAME LIFT/DESTACKER	WELDMENT
70	1	ST3520-W530	WELDMENT - GENERATION 5 PANEL BOTTOM GUARD	OUTSOURCE
71	1	Series 200 Energy Chain Cylinder	SERIES 200 ENERGY CHAIN x 40-1/2" O.A.L. w/ POLYMER MOUNTING BRACKETS "PIVOTING STANDARD" BOTH ENDS	BY OTHERS
72	4	Sick 101270	REFLECTOR, SICK 101270	BY OTHERS

ASSEMBLY:P1
:P2
:P3
:P4
:P5
:P6
:P7
:P8

DESTINATION: SHIPPING



PAINT COLOR: GRAY 7035

QTY: JOB #:

ASSEMBLY - AMAZON GEN 5
LIFT/DESTACKER (LH)

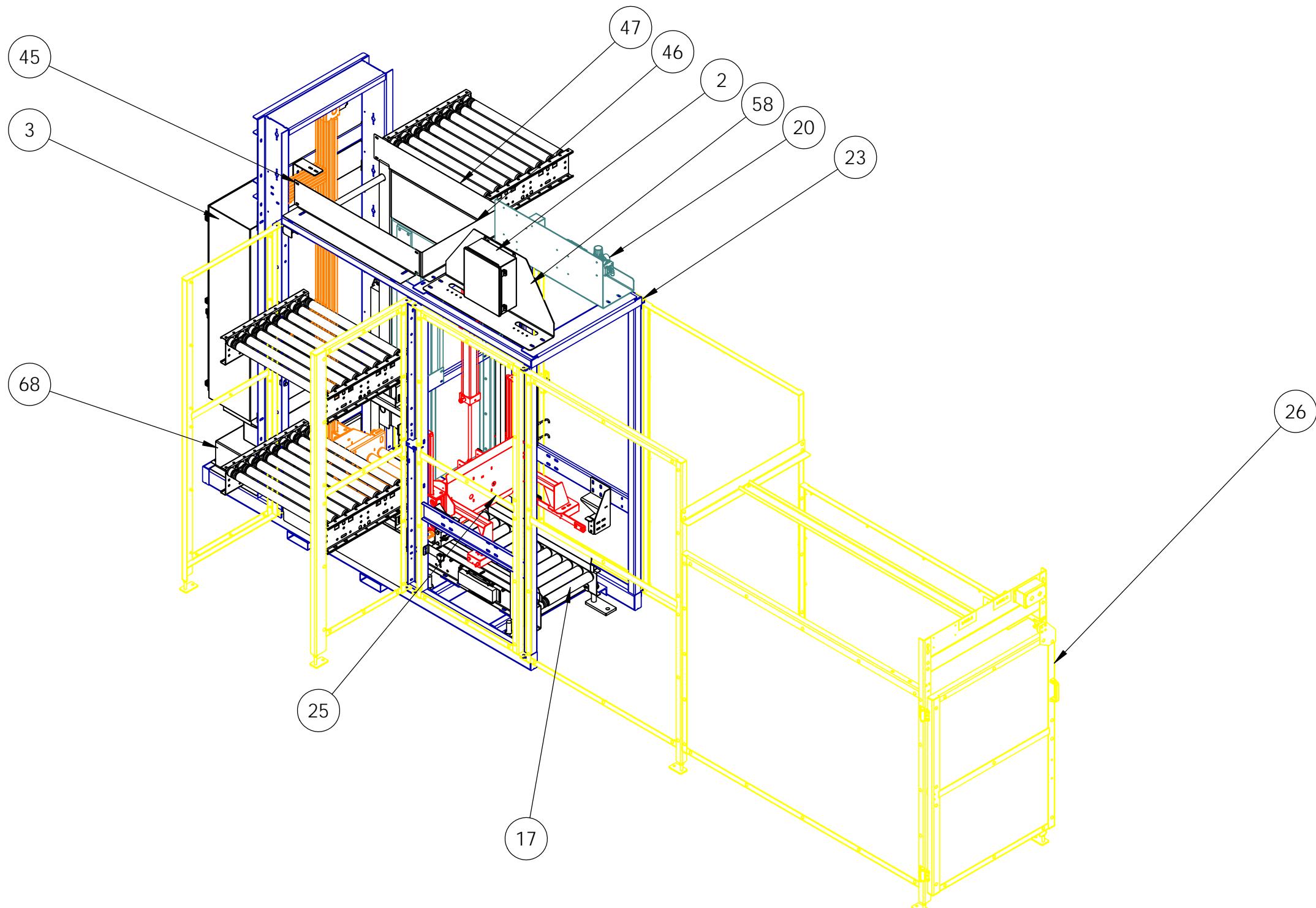
REV. DWG. NO.

ST3520-A002

WEIGHT: LBS

DATE: 7/26/17 DRAWN BY: JVM 1:48 2 OF 9

CONFIDENTIAL AND PROPRIETARY
NOTICE: This drawing and the components shown
are the property of CONVEYOR CONCEPTS OF
MICHIGAN, LLC. WRITTEN PERMISSION IS REQUIRED
TO REPRODUCE THIS DRAWING OR ANY PART OF IT,
OR TO MANUFACTURE THE ITEMS DEPICTED.



ASSEMBLY:P1
:P2
:P3
:P4
:P5
:P6
:P7
:P8

DESTINATION: SHIPPING

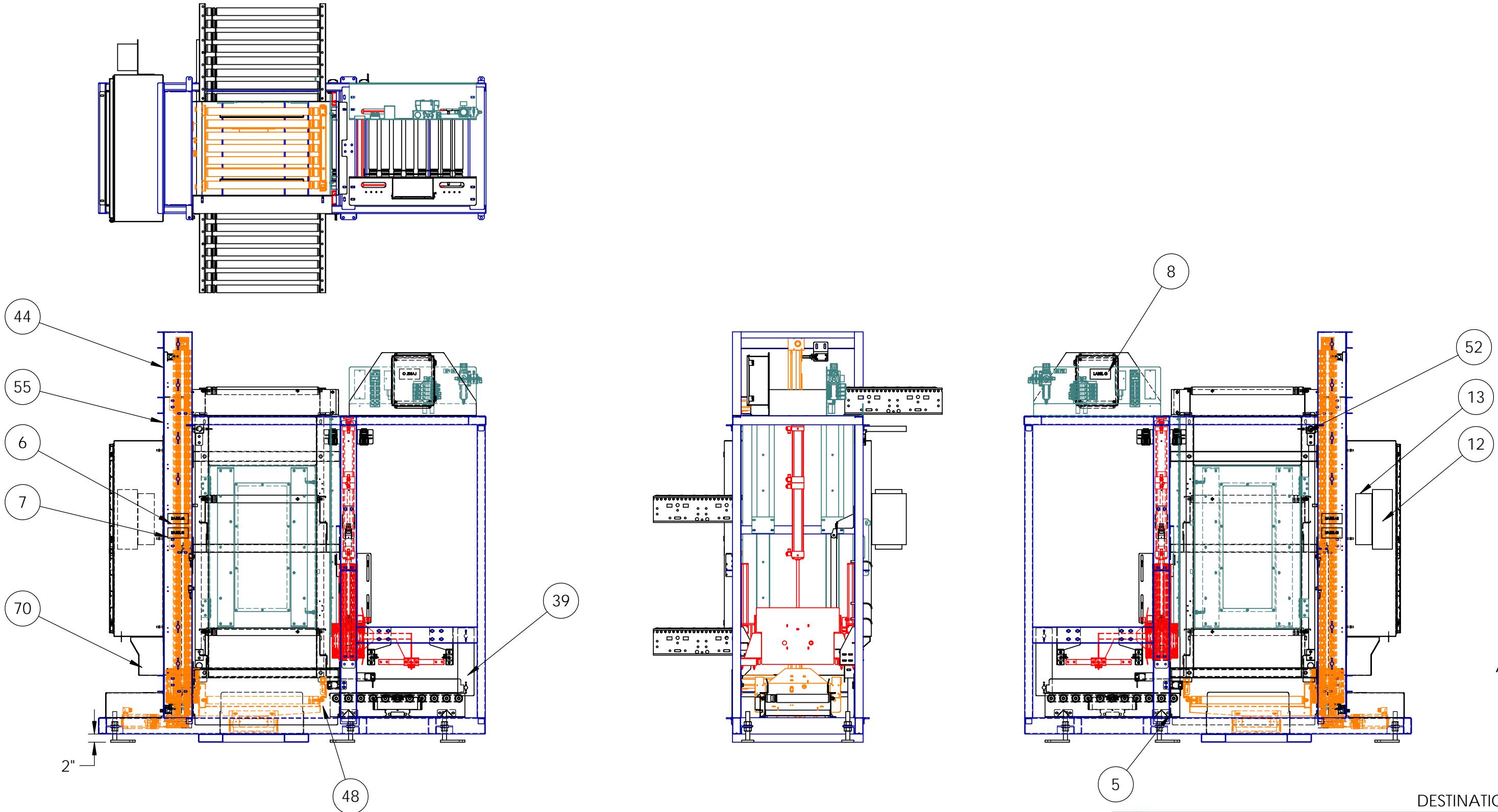


PAINT COLOR:	GRAY 7035
QTY:	JOB #:
ASSEMBLY - AMAZON GEN 5 LIFT/DESTACKER (LH)	

REV.	DWG. NO.
ST3520-A002	
DATE: 7/26/17	DRAWN BY: JVM 1:24 3 OF 9

WEIGHT: LBS

CONFIDENTIAL AND PROPRIETARY
NOTE: THIS DRAWING AND THE ITEMS SHOWN
ARE THE PROPERTY OF CONVEYOR CONCEPTS OF
MICHIGAN, LLC. WRITTEN PERMISSION IS REQUIRED
TO REPRODUCE THIS DRAWING OR ANY PART OF IT,
OR TO MANUFACTURE THE ITEMS DEPICTED.



ASSEMBLY:
P1
P2
P3
P4
P5
P6
P7
P8

DESTINATION: SHIPPING

**Conveyor
Concepts**
OF MICHIGAN, L.L.C.

PAINT COLOR: GRAY 7035

QTY: JOB #:

ASSEMBLY - AMAZON GEN 5
LIFT/DESTACKER (LH)

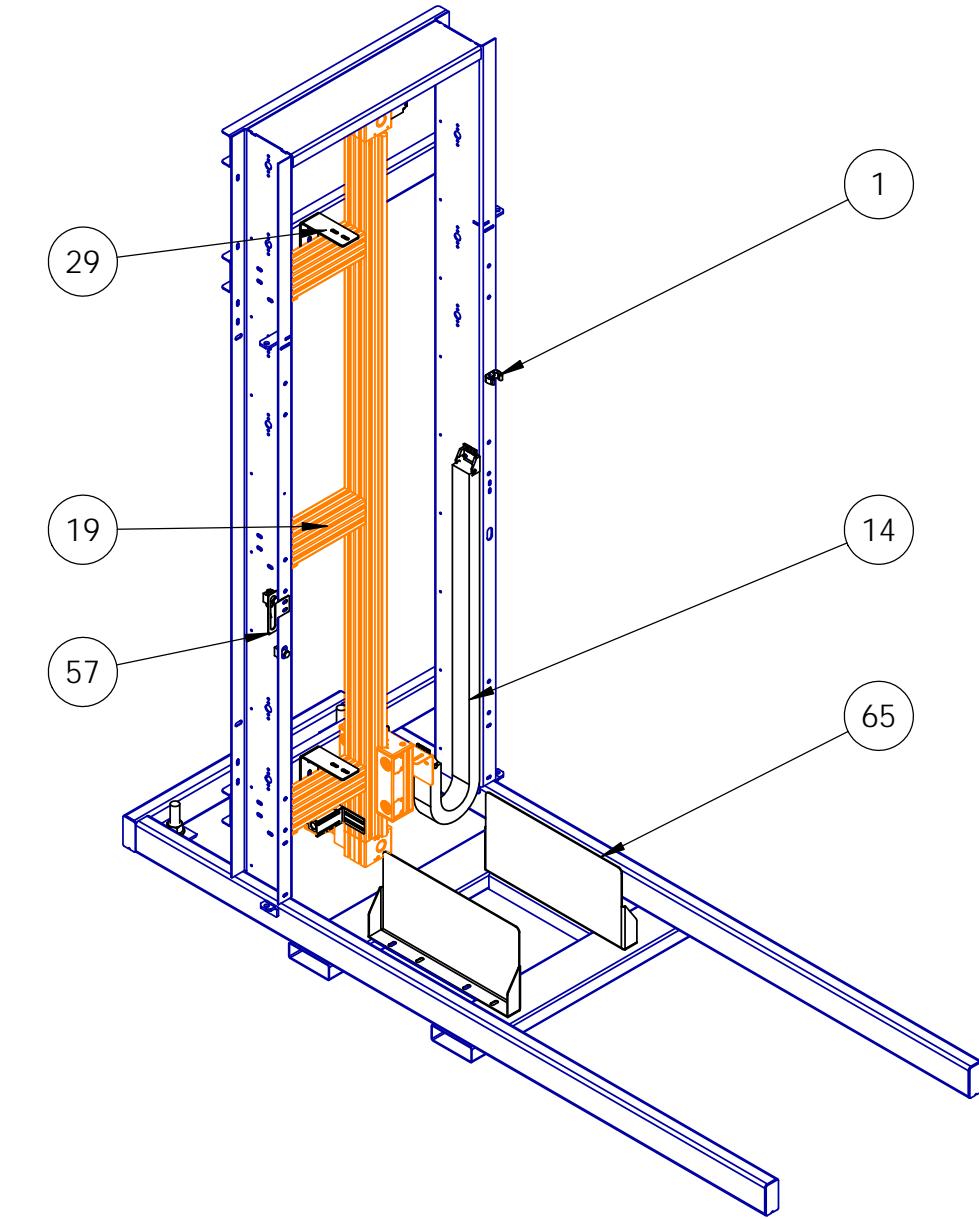
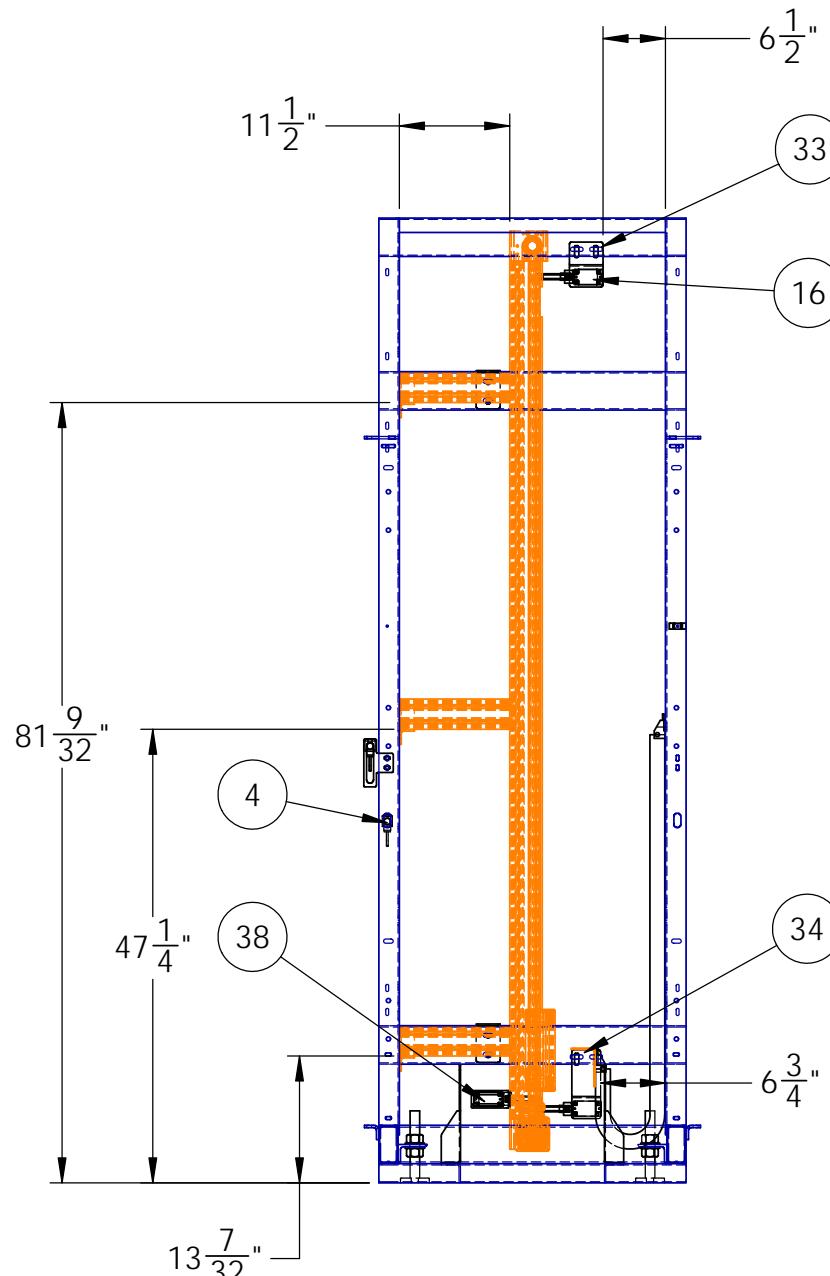
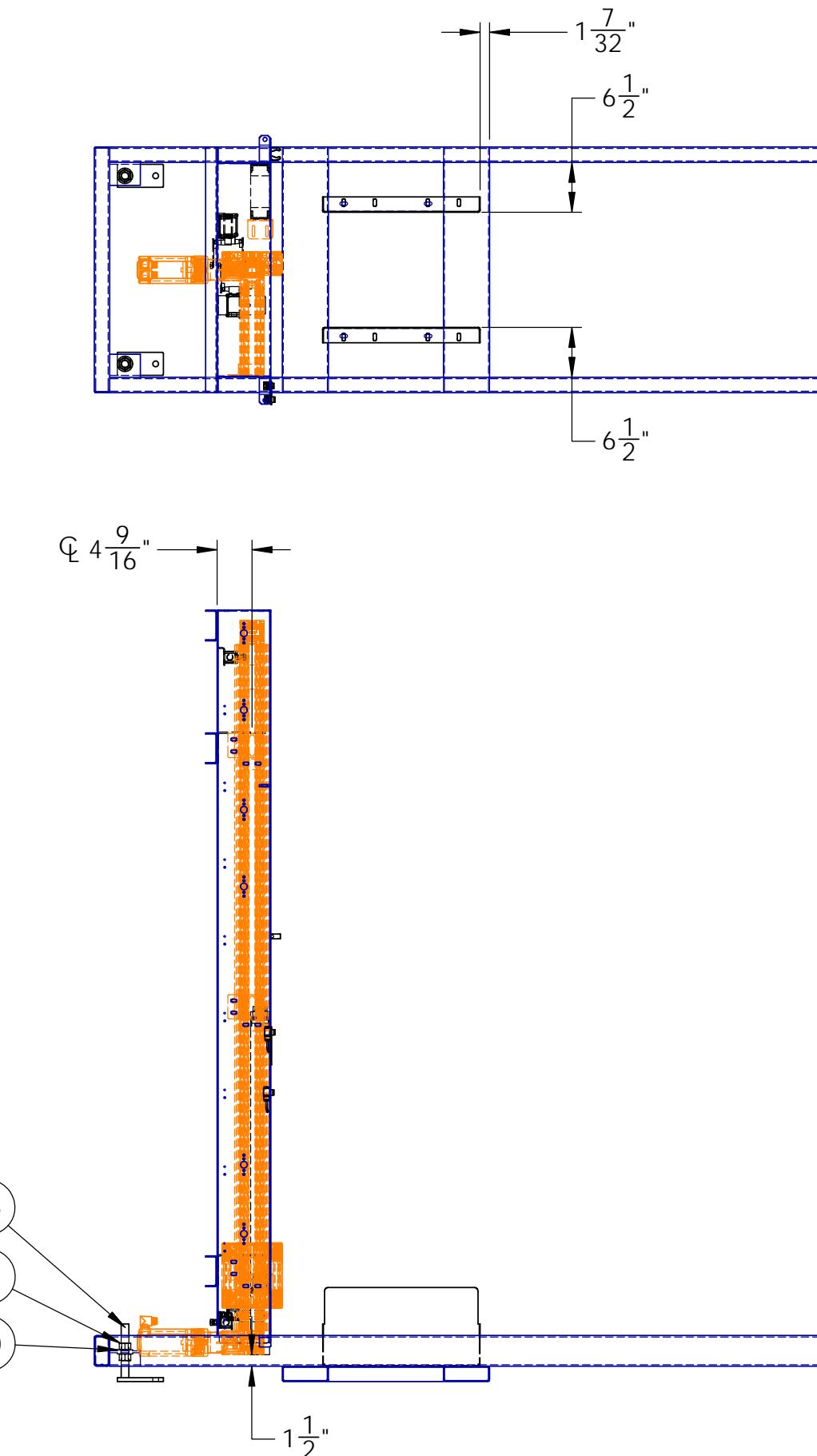
REV. DWG. NO.

ST3520-A002

WEIGHT: LBS

DATE: 7/26/17 DRAWN BY: JVM 1:24 4 OF 9

CONFIDENTIAL AND PROPRIETARY
NOTICE: THIS DRAWING AND THE INFORMATION SHOWN
ARE THE PROPERTY OF CONVEYOR CONCEPTS OF
MICHIGAN, LLC. WRITTEN PERMISSION IS REQUIRED
TO REPRODUCE THIS DRAWING OR ANY PART OF IT,
OR TO MANUFACTURE THE ITEMS DEPICTED.



ASSEMBLY:P1
P2
P3
P4
P5
P6
P7
P8

DESTINATION: SHIPPING

PAINT COLOR: GRAY 7035

QTY: JOB #:

ASSEMBLY - AMAZON GEN 5
LIFT/DESTACKER (LH)

**Conveyor
Concepts**
OF MICHIGAN, L.L.C.

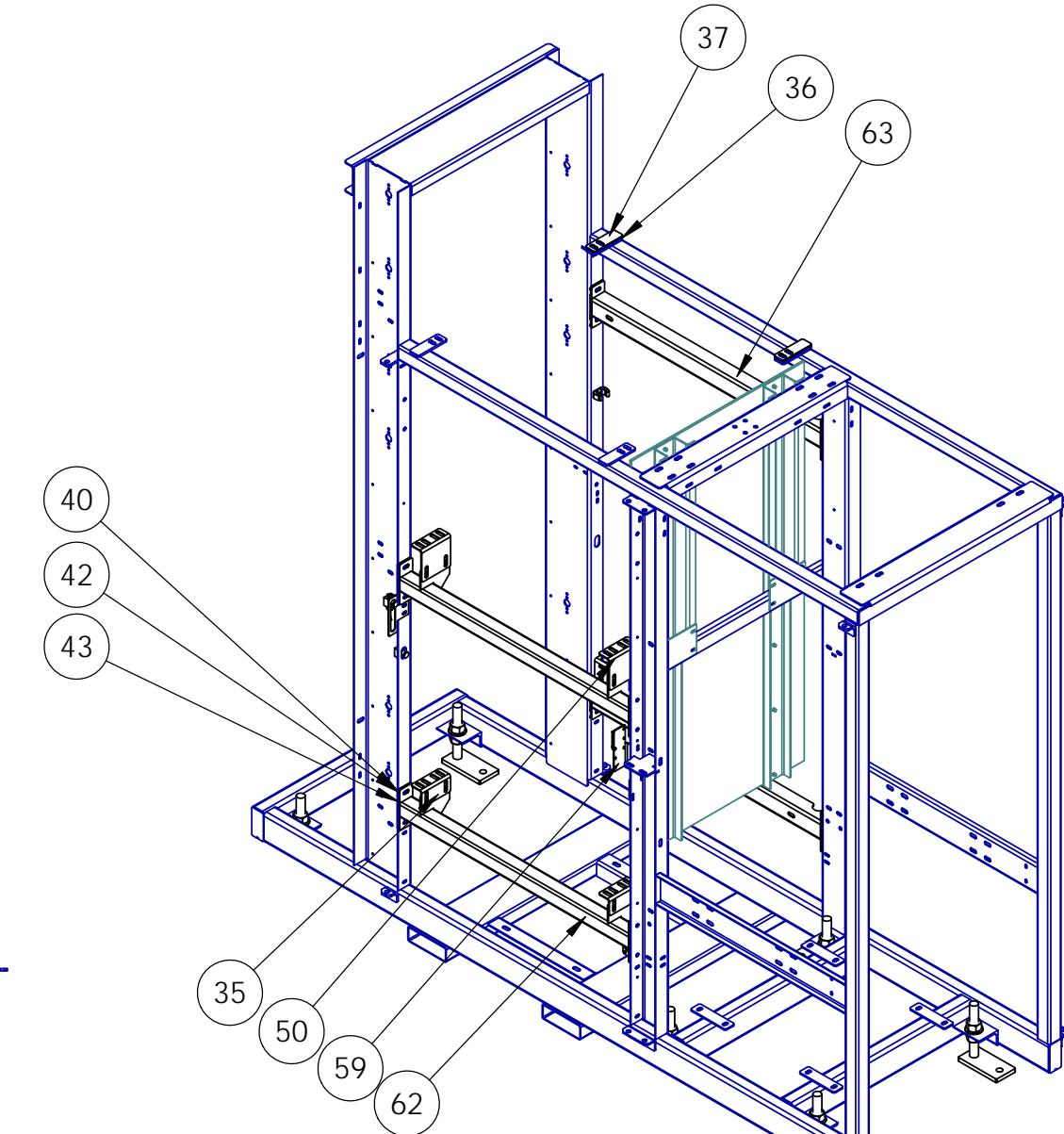
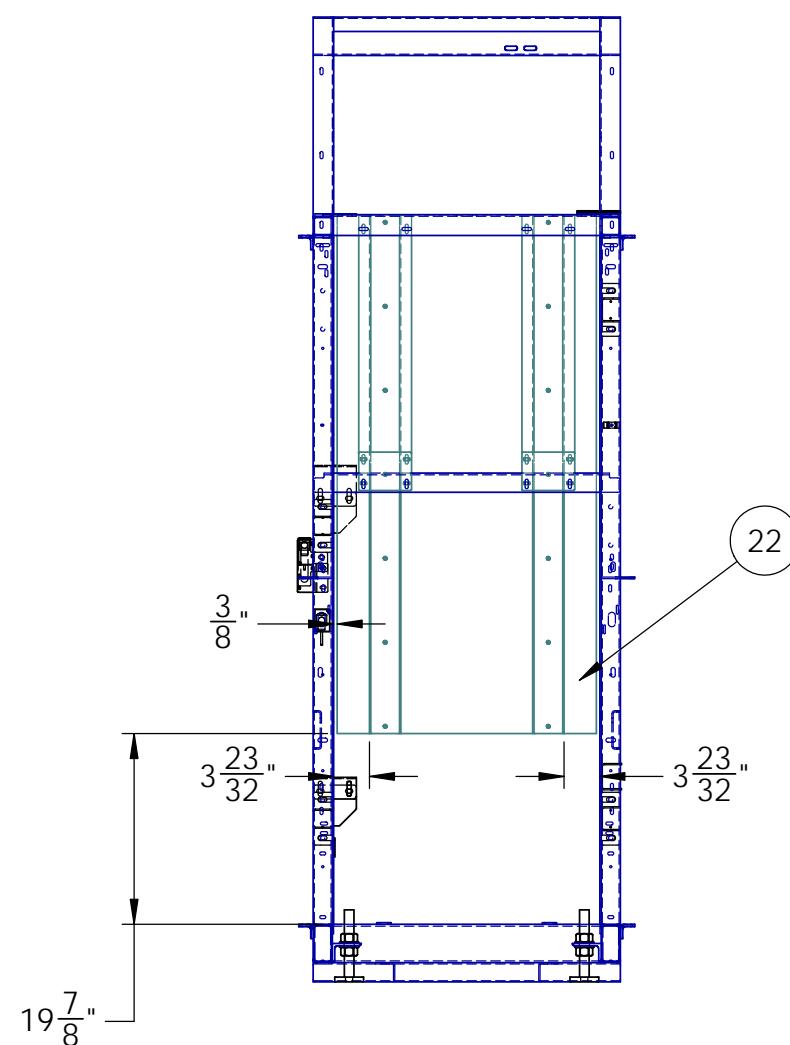
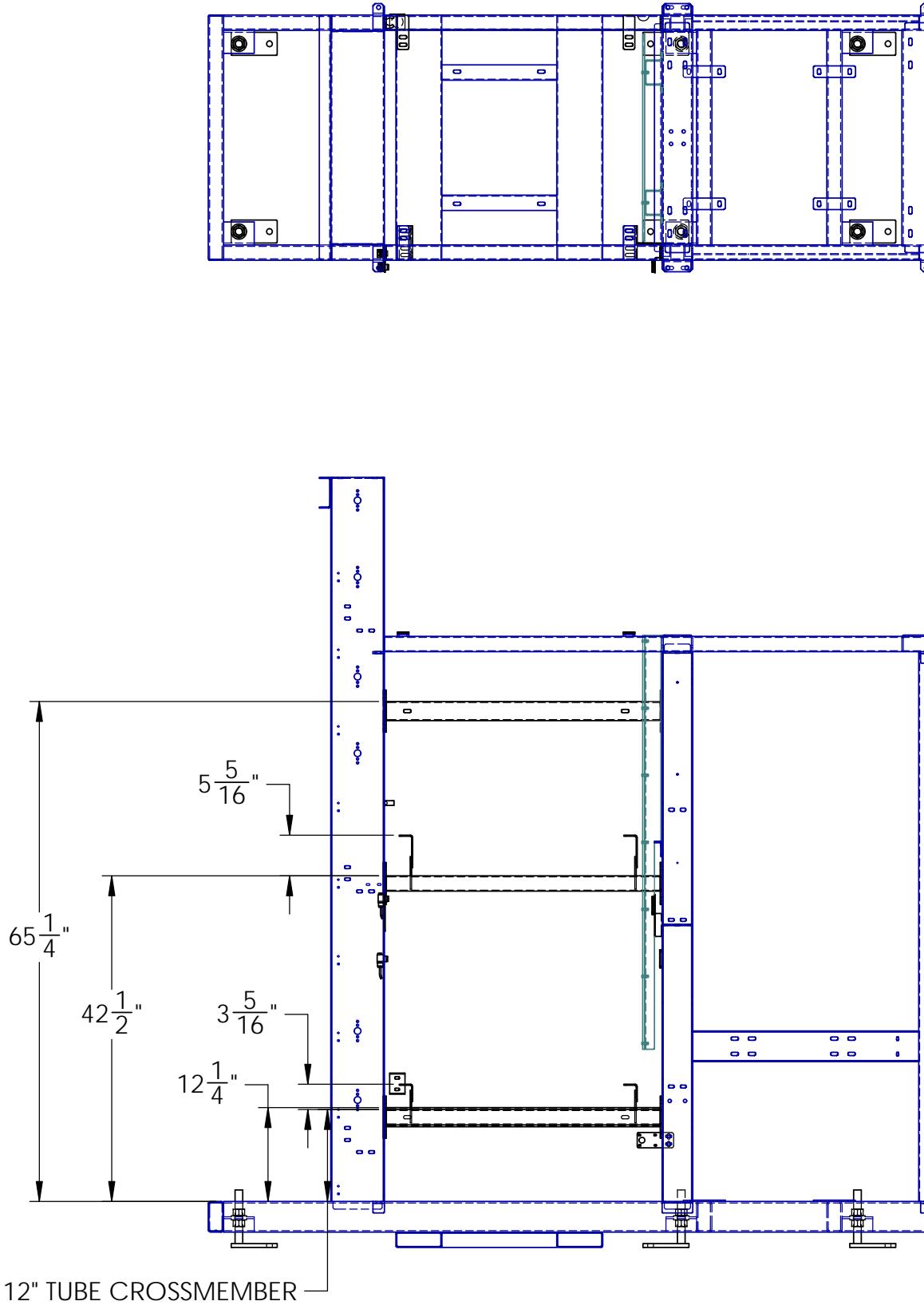
CONFIDENTIAL AND PROPRIETARY
NOTICE: THE DRAWINGS AND RELATED INFORMATION
ARE THE PROPERTY OF CONVEYOR CONCEPTS OF
MICHIGAN, LLC. WRITTEN PERMISSION IS REQUIRED
TO REPRODUCE THIS DRAWING OR ANY PART OF IT,
OR TO MANUFACTURE THE ITEMS DEPICTED.

WEIGHT: LBS

REV. DWG. NO.

ST3520-A002

DATE: 7/26/17 DRAWN BY: JVM 1:20 5 OF 9



ASSEMBLY: P1
P2
P3
P4
P5
P6
P7
P8

DESTINATION: SHIPPING

PAINT COLOR: GRAY 7035

QTY: JOB #:

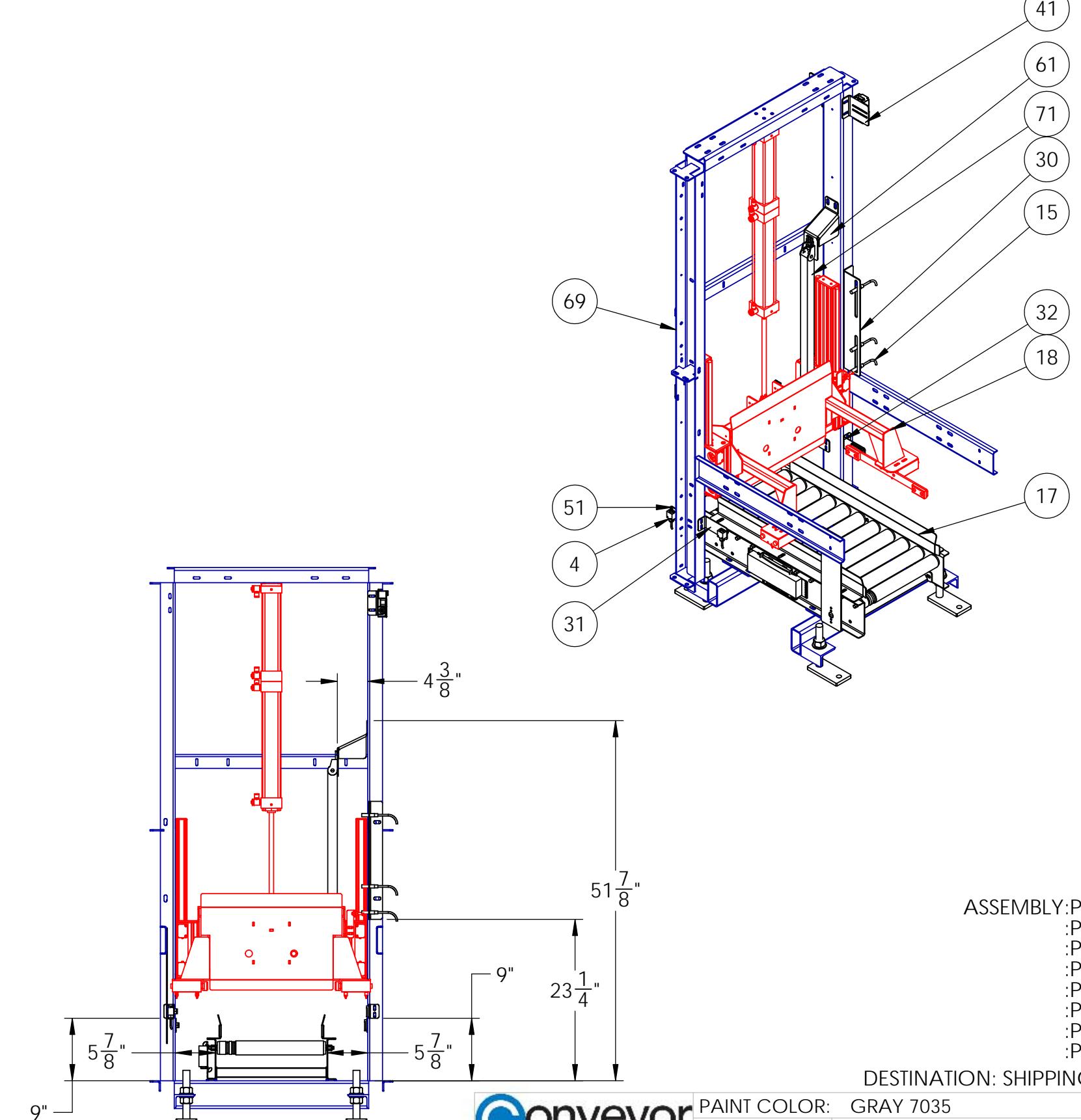
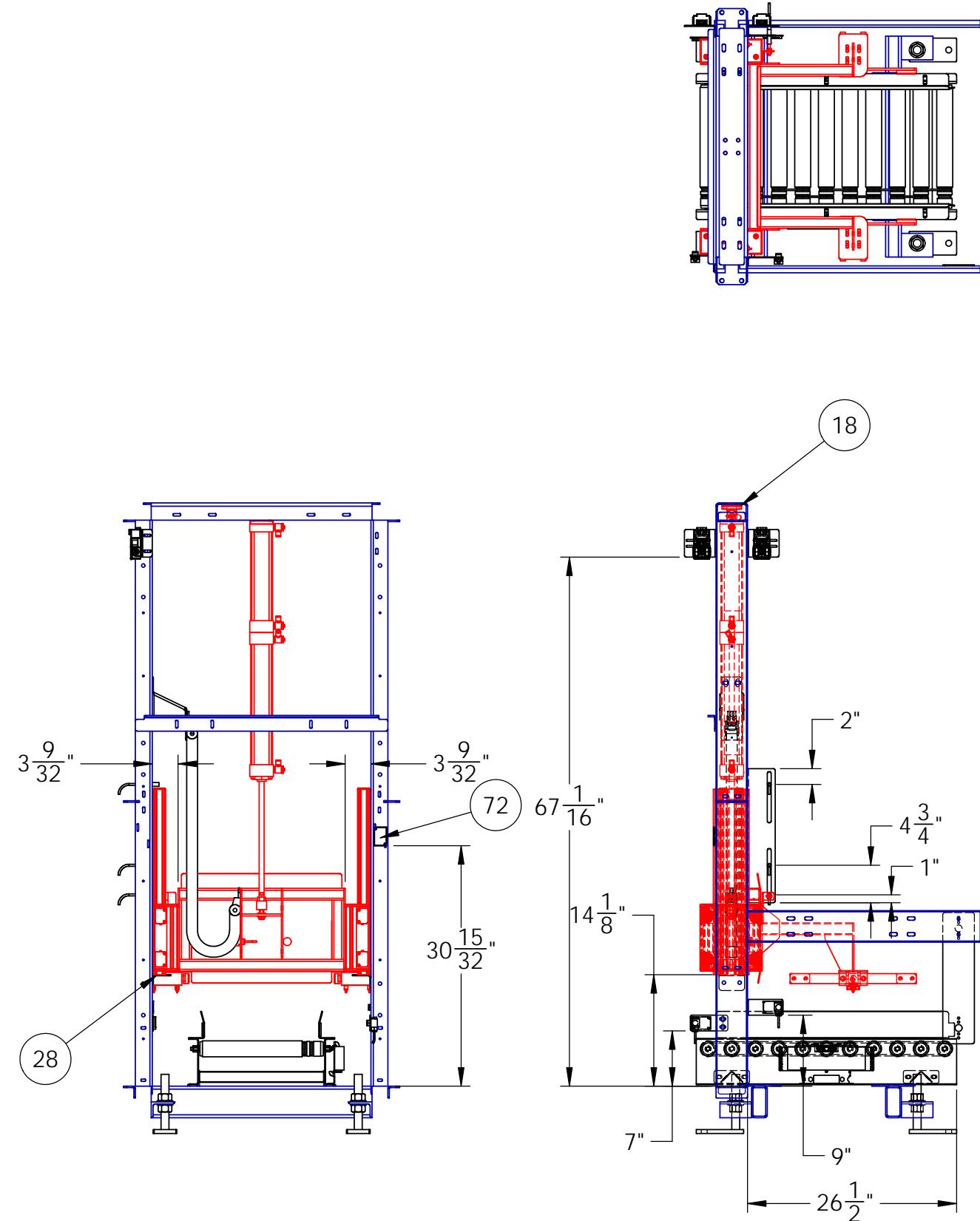
ASSEMBLY - AMAZON GEN 5
LIFT/DESTACKER (LH)

Conveyor Concepts
OF MICHIGAN, L.L.C.

CONFIDENTIAL AND PROPRIETARY
NOTE: THIS DRAWING AND THE CONCEPTS SHOWN
ARE THE PROPERTY OF CONVEYOR CONCEPTS OF
MICHIGAN, LLC. WRITTEN PERMISSION IS REQUIRED
TO REPRODUCE THIS DRAWING OR ANY PART OF IT,
OR TO MANUFACTURE THE ITEMS DEPICTED.

WEIGHT: LBS

REV.	DWG. NO.
ST3520-A002	
DATE: 7/26/17	DRAWN BY: JVM 1:20 6 OF 9



**Conveyor
Concepts**
OF MICHIGAN, L.L.C.

WEIGHT: LBS

CONFIDENTIAL AND PROPRIETARY
NOTE: THIS DRAWING AND THE INFORMATION SHOWN
ARE THE PROPERTY OF CONVEYOR CONCEPTS OF
MICHIGAN, LLC. WRITTEN PERMISSION IS REQUIRED
TO REPRODUCE THIS DRAWING OR ANY PART OF IT,
OR TO MANUFACTURE THE ITEMS DEPICTED.

REV.	DWG. NO.
	ST3520-A002
DATE: 7/26/17	DRAWN BY: JVM 1:18 7 OF 9

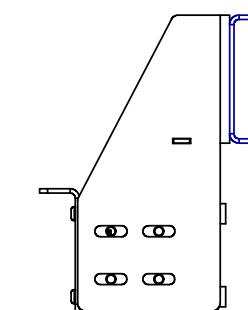
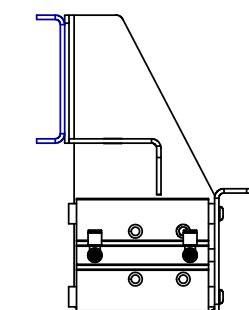
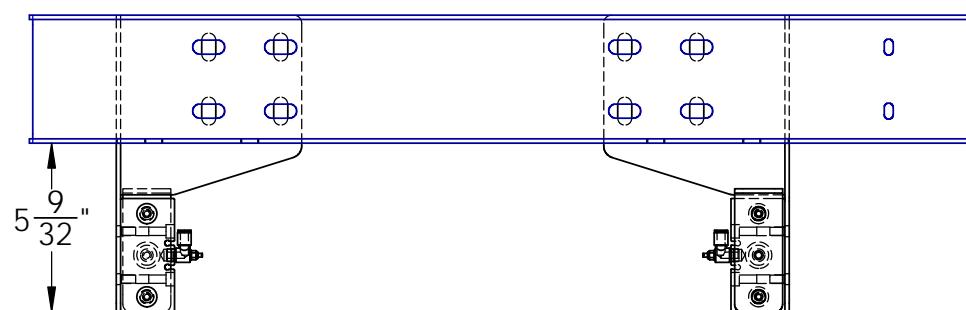
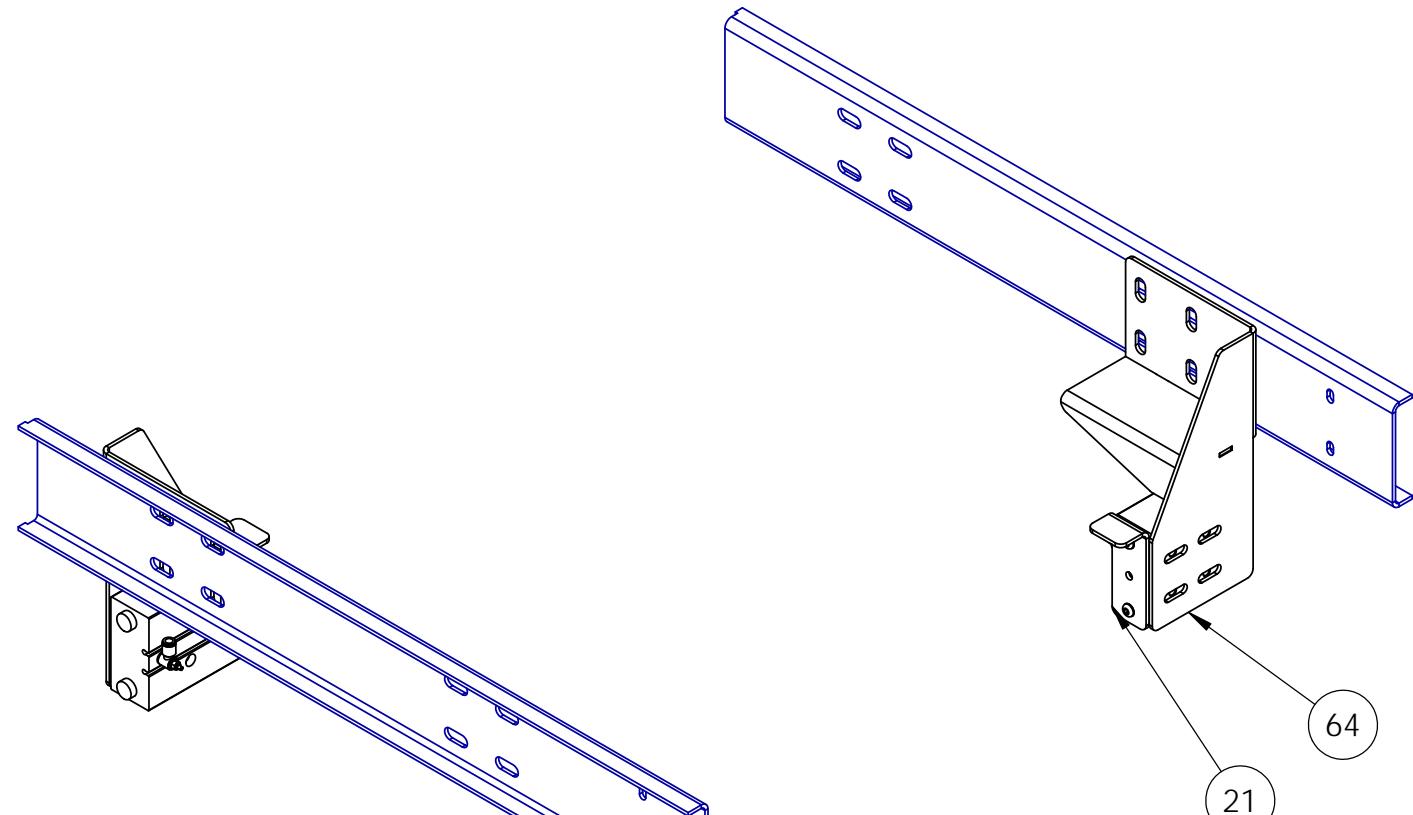
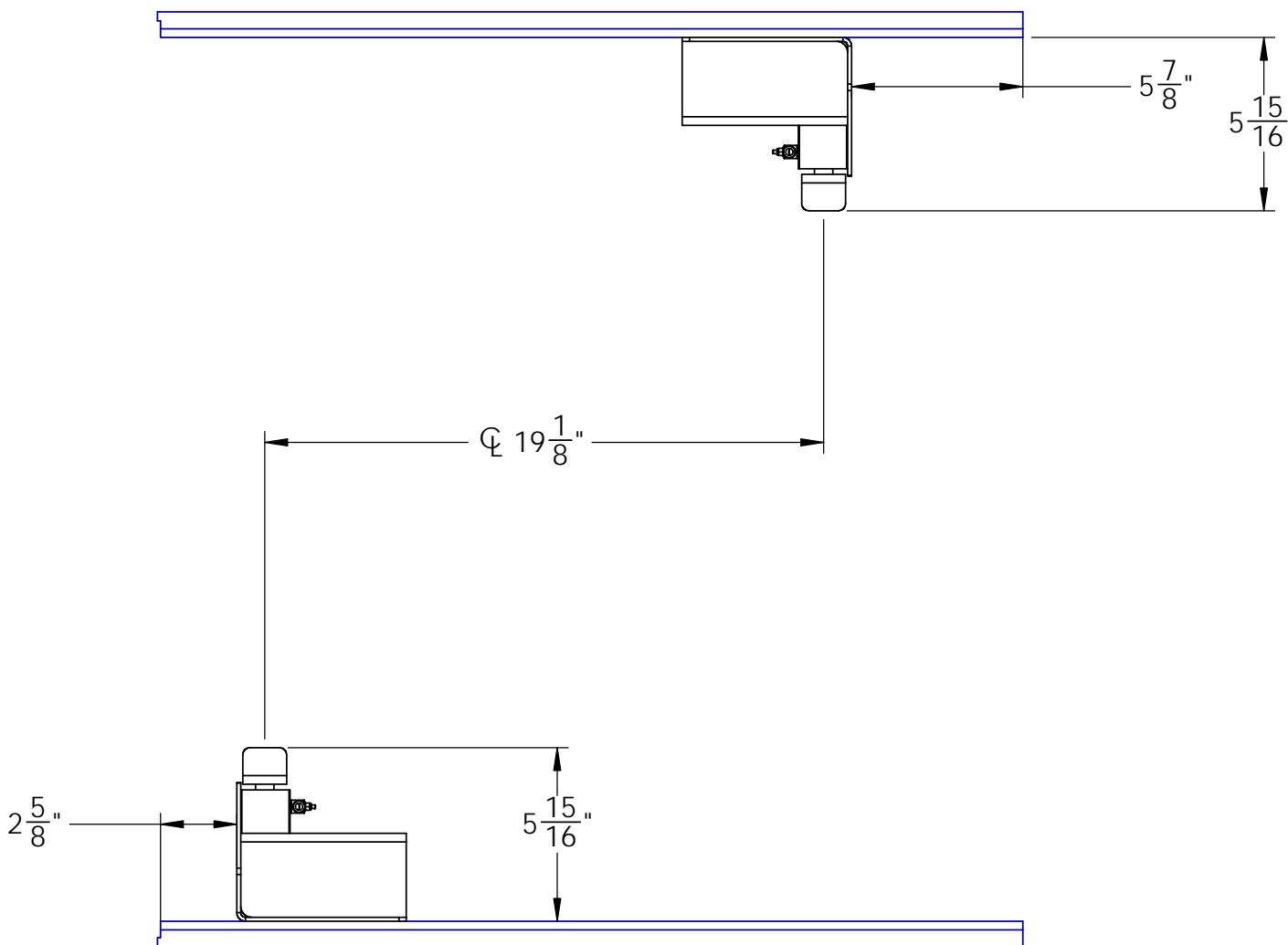
ASSEMBLY: P1
P2
P3
P4
P5
P6
P7
P8

DESTINATION: SHIPPING

PAINT COLOR: GRAY 7035

QTY: JOB #:

ASSEMBLY - AMAZON GEN 5
LIFT/DESTACKER (LH)



ASSEMBLY:
P1
P2
P3
P4
P5
P6
P7
P8

DESTINATION: SHIPPING

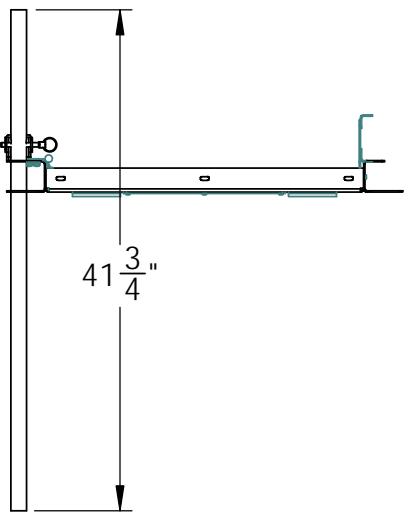
Conveyor Concepts
OF MICHIGAN, L.L.C.

PAINT COLOR:	GRAY 7035
QTY:	JOB #:
ASSEMBLY - AMAZON GEN 5 LIFT/DESTACKER (LH)	

REV.	DWG. NO.
ST3520-A002	
DATE: 7/26/17	DRAWN BY: JVM 1:6 8 OF 9

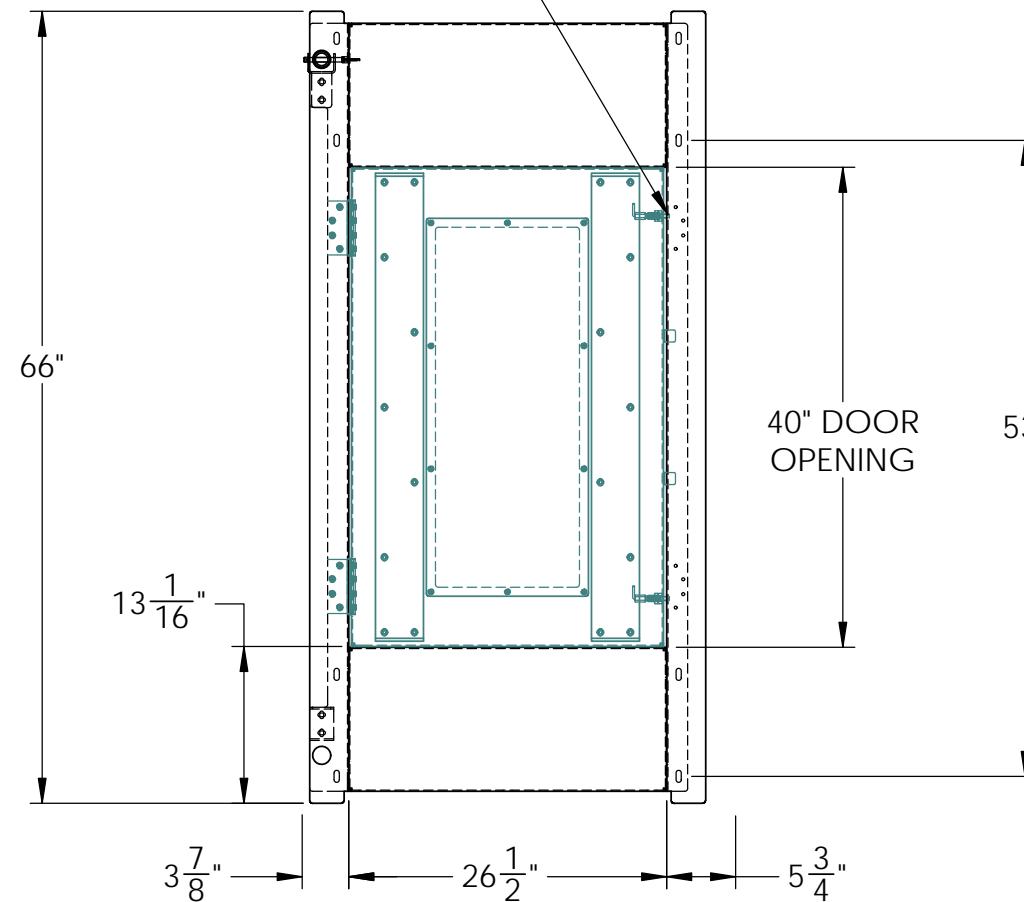
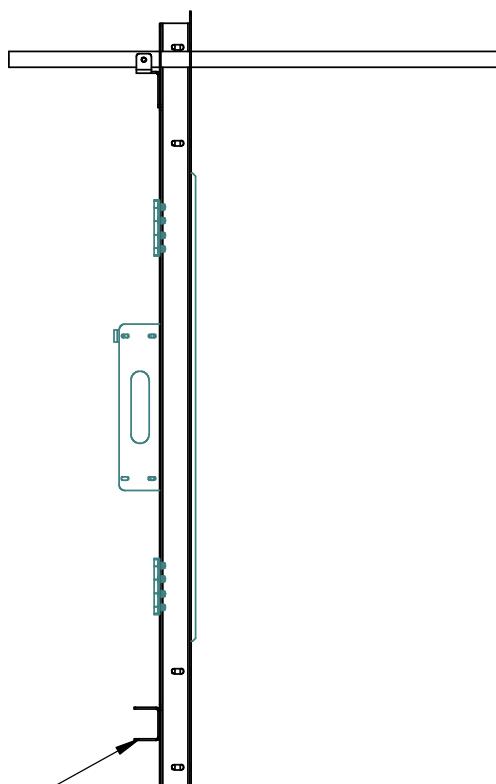
WEIGHT: LBS

CONFIDENTIAL AND PROPRIETARY
NOTE: THIS DRAWING AND THE ITEMS SHOWN
ARE THE PROPERTY OF CONVEYOR CONCEPTS OF
MICHIGAN, LLC. WRITTEN PERMISSION IS REQUIRED
TO REPRODUCE THIS DRAWING OR ANY PART OF IT,
OR TO MANUFACTURE THE ITEMS DEPICTED.



DRILL FOR PINS
@ ASSEMBLY

ATTACH PIN
LANYARD TO PIPE
@ ASSEMBLY



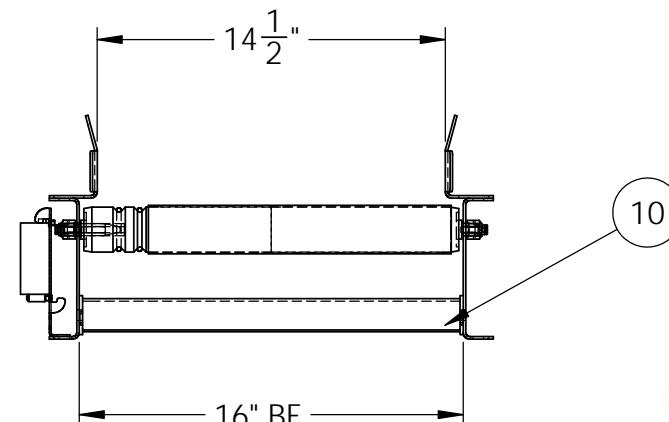
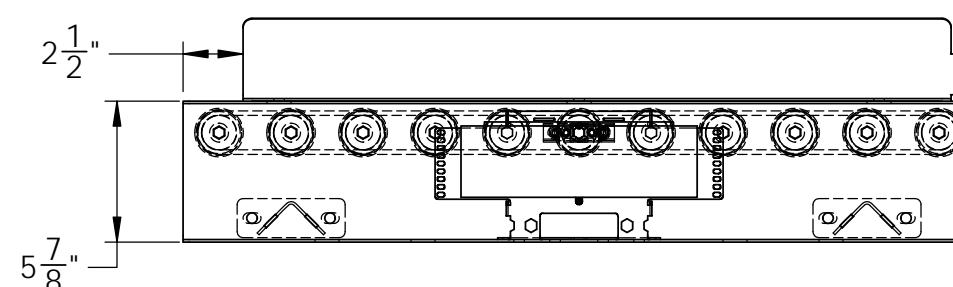
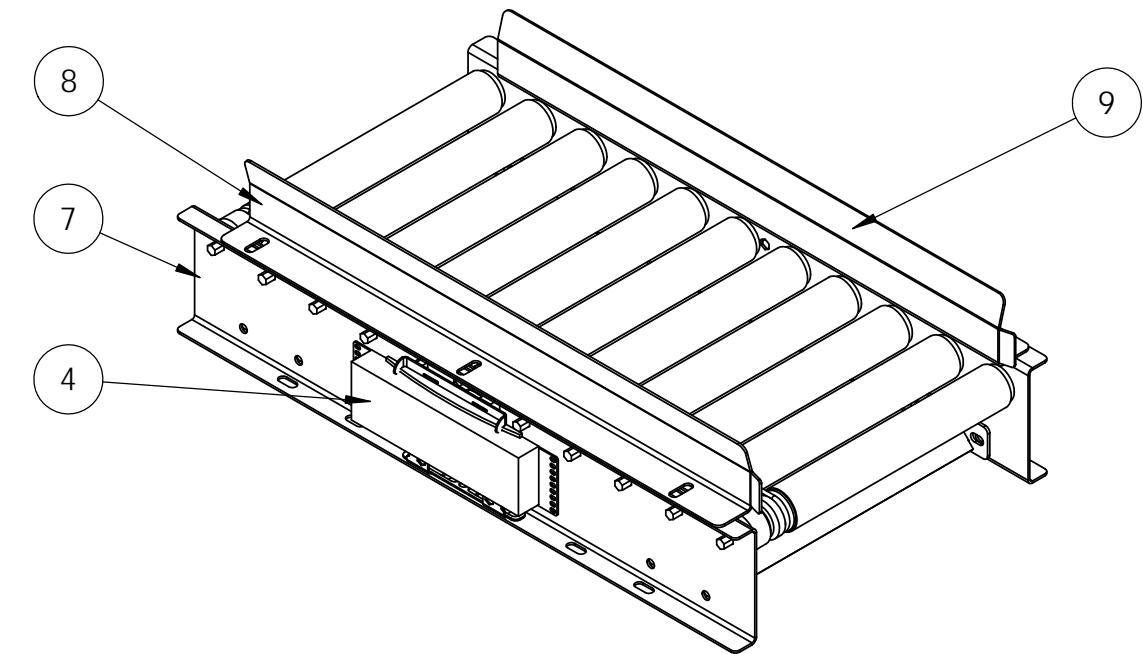
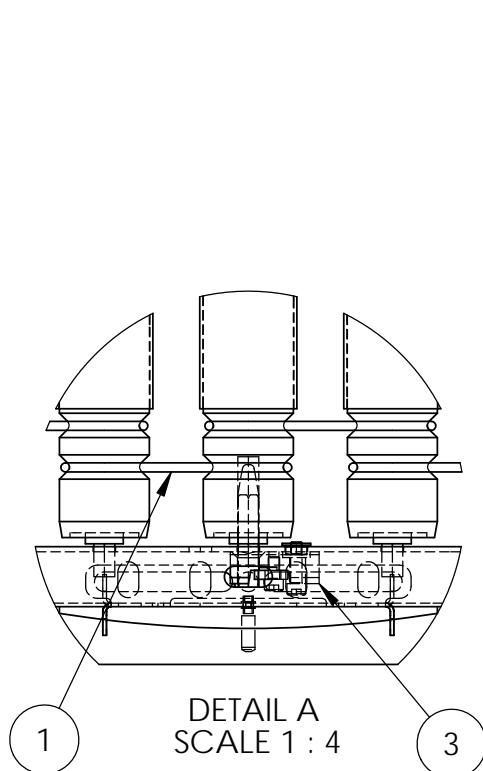
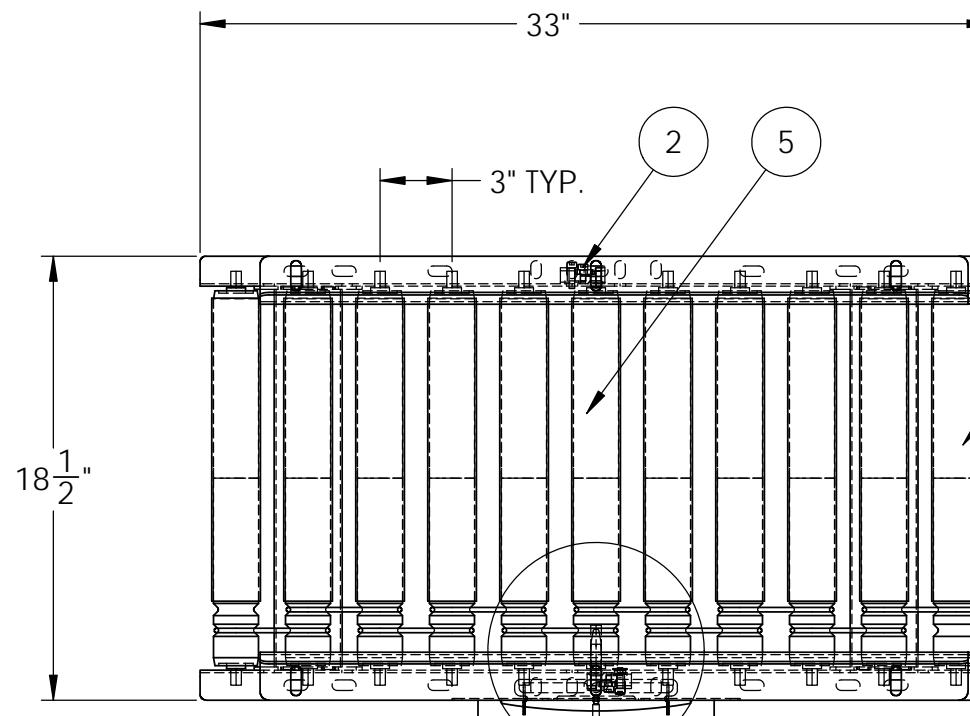
PAINT COLOR: GRAY 7035
QTY: JOB #:
ASSEMBLY - AMAZON GEN 5
LIFT/DESTACKER (LH)

CONFIDENTIAL AND PROPRIETARY
NOTE: THIS DRAWING AND THE INFORMATION SHOWN
ARE THE PROPERTY OF CONVEYOR CONCEPTS OF
MICHIGAN, LLC. WRITTEN PERMISSION IS REQUIRED
TO REPRODUCE THIS DRAWING OR ANY PART OF IT,
OR TO MANUFACTURE THE ITEMS DEPICTED.

REV.	DWG. NO.
ST3520-A002	
DATE: 7/26/17	DRAWN BY: JVM 1:16 9 OF 9

WEIGHT: LBS

ITEM	QTY	PART#	DESCRIPTION	MATERIAL TYPE
1	10	G0201-EABAA	1.9" SLAVE O-RING 3" CC .187 x 9-9/16" #0276646470	BY OTHERS
2	1	K0402-43AAA	POWERED ROLLER RETAINER K0402-43AAA	BY OTHERS
3	1	K0402-43BAA	POWERED ROLLER BRACKET, K0402-43BAA	BY OTHERS
4	1	K0407-45AAA	DUAL MOTOR CONTROLLER CARD, K0419-23	BY OTHERS
5	1	S3483-21960_SIMPLE 16BF MDR	50MM CPLD PWR RLR, 388.7MM SHL 2-GRV SGL, #S360204031	BY OTHERS
6	10	S3483-21960_SIMPLE 16BF	ROLLER, 1.9G16HQ PAX 2 GROOVE, 15-5/16" SHELL, 17" AXLE, #S348315950	BY OTHERS
7	2	ST3520-D009	DETAIL - MDR CONVEYOR SIDE FRAME	OUTSOURCE
8	1	ST3520-D307	DETAIL - SIDE GUIDE, INFEED MDR CONVEYOR LH	OUTSOURCE
9	1	ST3520-D308	DETAIL - SIDE GUIDE, INFEED MDR CONVEYOR RH	OUTSOURCE
10	2	ST3520-W010	WELDMENT - MDR CROSSMEMBER	WELDMENT



ASSEMBLY:P1
:P2
:P3
:P4
:P5
:P6
:P7
:P8

DESTINATION: ASSEMBLY

PAINT COLOR: GRAY 7035

QTY: JOB #:

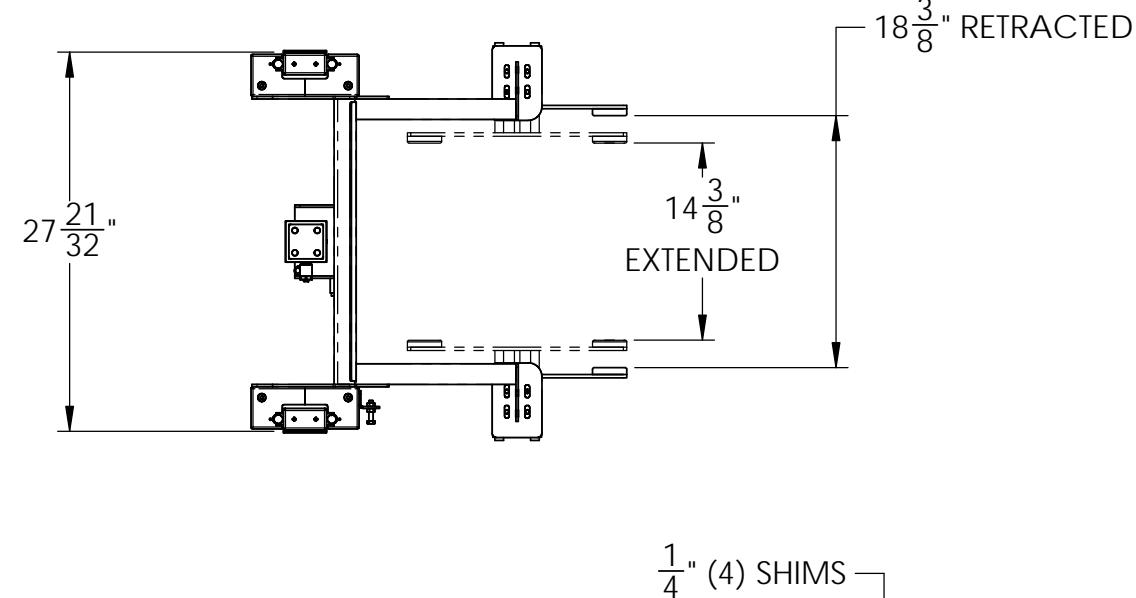
ASSEMBLY - MDR INFEED
CONVEYOR


Conveyor
Concepts
OF MICHIGAN, L.L.C.

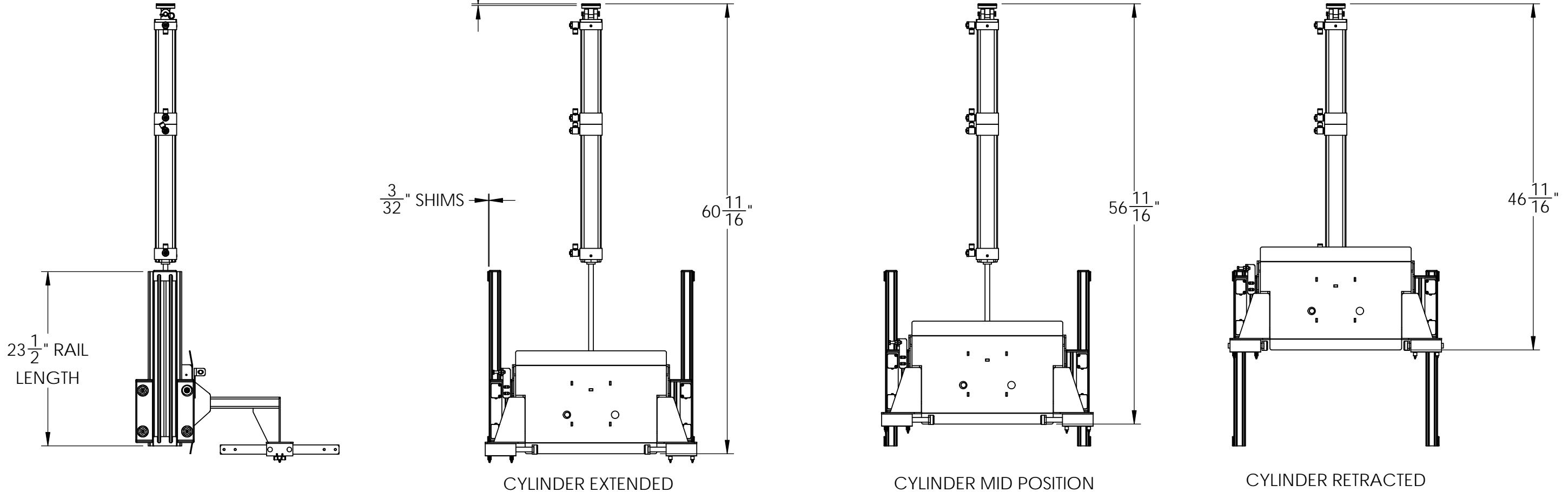
CONFIDENTIAL AND PROPRIETARY
NOTE: THIS DRAWING AND THE INFORMATION SHOWN
ARE THE PROPERTY OF CONVEYOR CONCEPTS OF
MICHIGAN, LLC. WRITTEN PERMISSION IS REQUIRED
TO REPRODUCE THIS DRAWING OR ANY PART OF IT,
OR TO MANUFACTURE THE ITEMS DEPICTED.

REV. DWG. NO.
ST3520-A003
DATE: 7/26/17 DRAWN BY: JVM 1:8 1 OF 1

WEIGHT: 187.19 LBS

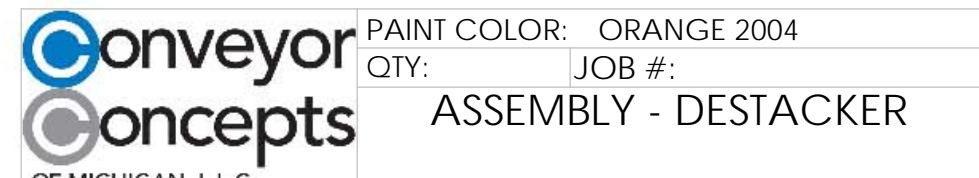


ITEM	LH QTY.	RH QTY.	PART#	DESCRIPTION	MATERIAL TYPE	LENGTH
1	1	1	42EF-D1MPAK-F4	DIFFUSED PHOTO EYE, ALLEN BRADLEY RIGHT SIGHT, #42EF-DAMPAK-F4	BY OTHERS	
2	2	2	AA SL5125N97 TRACK AA 2	DESTACKER GUIDES	PURCHASE	
3	2	2	FWH_7/16_BO	FLAT WASHER (HARDENED), 7/16" DIA., BLACK OXIDE	FASTENER	
4	1	1	HHCS_5/16-18X1.50_ZP	HHCS 5/16"-18 X 1 1/2" LONG ZP GRD5	FASTENER	
5	1	1	HJN_7/16-20_ZP_G5	HEX JAM NUT, 7/16"-20 UNF, ZP, G5	FASTENER	
6	2	2	HN_5/16-18_ZP_G5	HEX NUT, 5/16"-18 UNC, ZP, G5	FASTENER	
7	1	1	NLJN_7/16-20_ZP	NYLON-INSERT JAM LOCK NUT, 7/16"-20 UNF, ZP	FASTENER	
8	2	2	ST3520-A022	ASSEMBLY - DESTACKER CLAMP ARM, NP08-15-0071	PURCHASE	
9	4	4	ST3520-D002	DETAIL - SHIM PLATE, PALLETI RAIL, 16GA.	OUTSOURCE	
10	4	4	ST3520-D003	DETAIL - CYLINDER SHIM 16GA.	OUTSOURCE	2 1/2"
11	1	-	ST3520-D071	DETAIL - RH DESTACKER PROX FLAG	OUTSOURCE	
12	4	4	ST3520-D074	DETAIL - SHIM PLATE, PALLETI RAIL, 22GA.	OUTSOURCE	
13	-	1	ST3520-D145	DETAIL - LH DESTACKER PROX FLAG	OUTSOURCE	
14	4	4	ST3520-D569	DETAIL - SHIM PLATE, PALLETI RAIL, 12GA.	OUTSOURCE	
15	1	1	ST3520-W002	WELDMENT - DESTACKER ARM	WELDMENT	
16	1	1	TRD 3P-TA-MX0-2.5x14-TA-MP2-2.5x10	TRD 3-POSITION NFPA CYLINDER, 2-1/2" BORE X 14" STROKE W/10" MID POSITION, #3P-TA-MX0-2.5x14-H3-OP 2 & 6-With-TA-MP2-2.5x10-C7-OP 2 & 6 PORTS @ 2 & 6, CUSHIONS @ 3 & 7	PURCHASE	



:P1
:P2
:P3
:P4
:P5
:P6
:P7
:P8

DESTINATION: ASSEMBLY

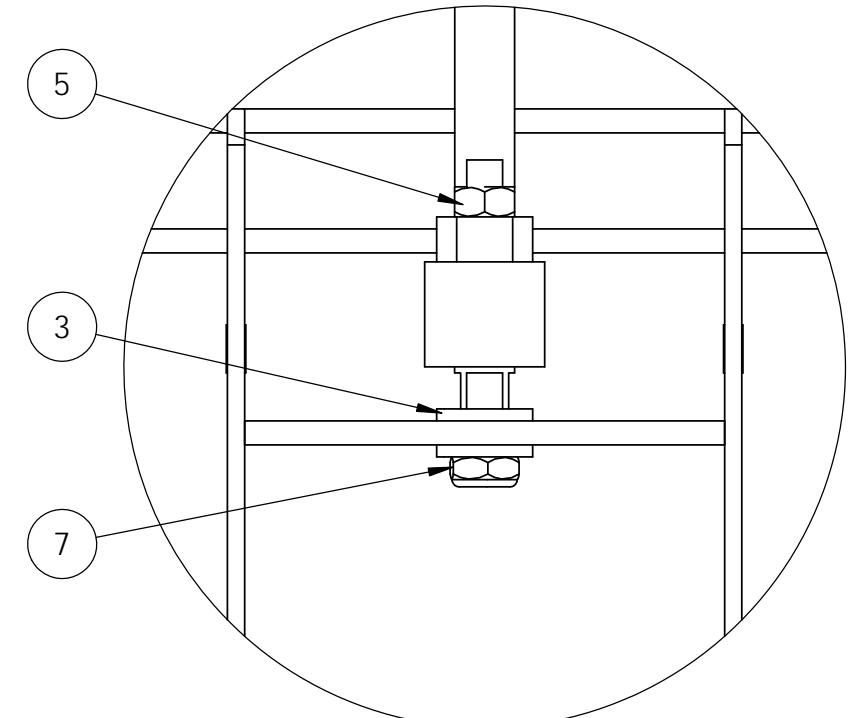
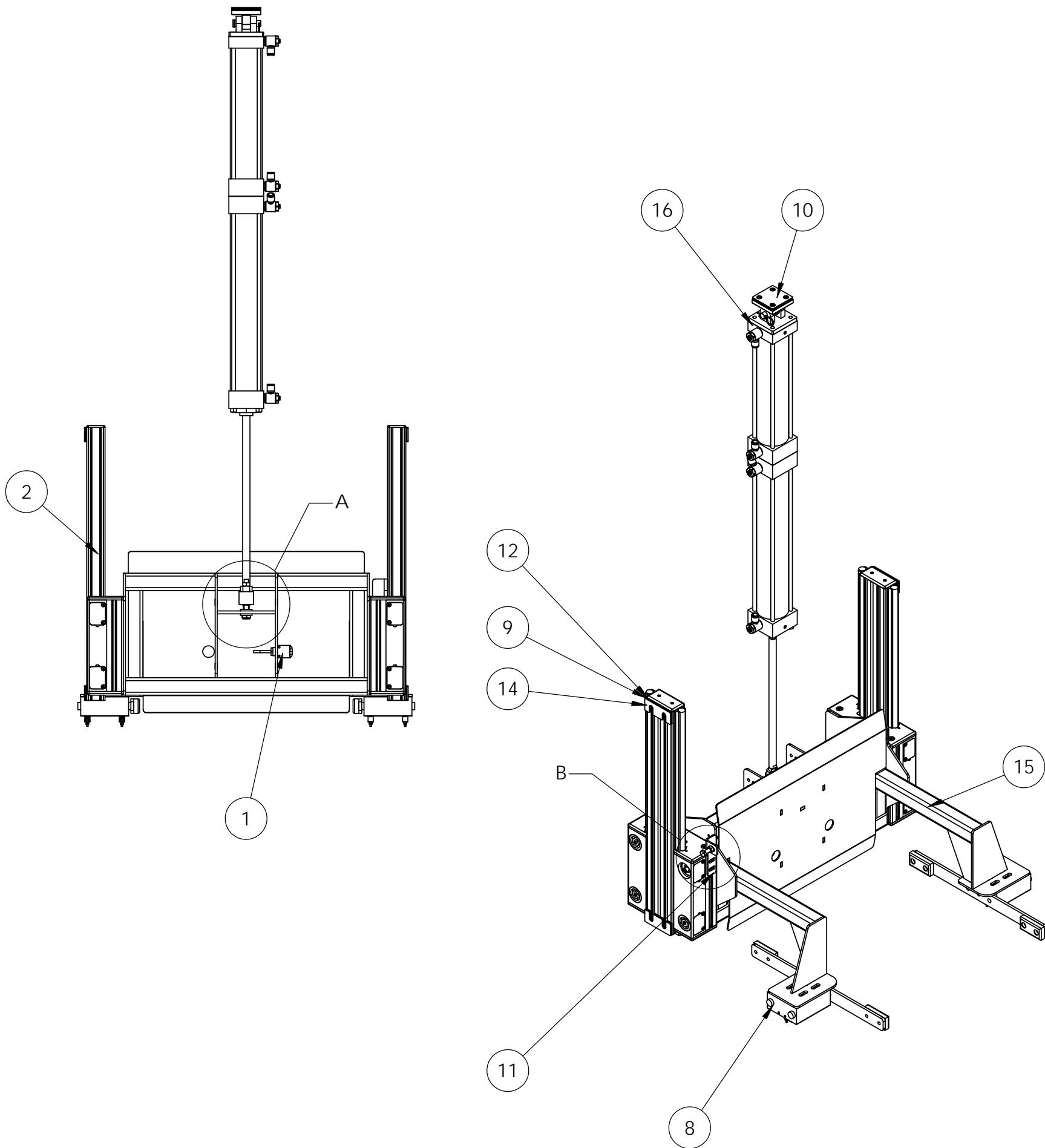


REV. DWG. NO. ST3520-A004
DATE: 7/26/17 DRAWN BY: JVM 1:14 1 OF 3

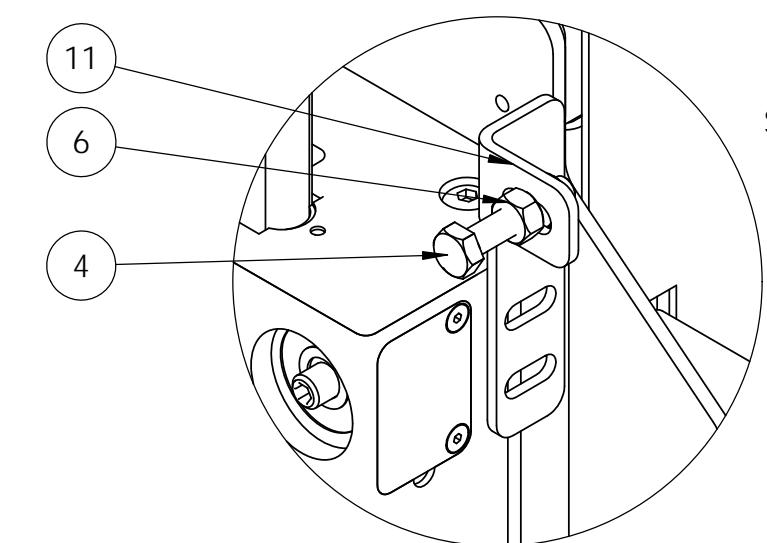
WEIGHT: 198 LBS

CONFIDENTIAL AND PROPRIETARY
NOTICE: This drawing and the equipment shown
are the property of CONVEYOR CONCEPTS OF
MICHIGAN, LLC. WRITTEN PERMISSION IS REQUIRED
TO REPRODUCE THIS DRAWING OR ANY PART OF IT,
OR TO MANUFACTURE THE ITEMS DEPICTED.

DETAIL A
SCALE 1 : 2



DETAIL B
SCALE 1 : 2



:P1
:P2
:P3
:P4
:P5
:P6
:P7
:P8

DESTINATION: ASSEMBLY

**Conveyor
Concepts**
OF MICHIGAN, L.L.C.

PAINT COLOR: ORANGE 2004

QTY: JOB #:

ASSEMBLY - DESTACKER

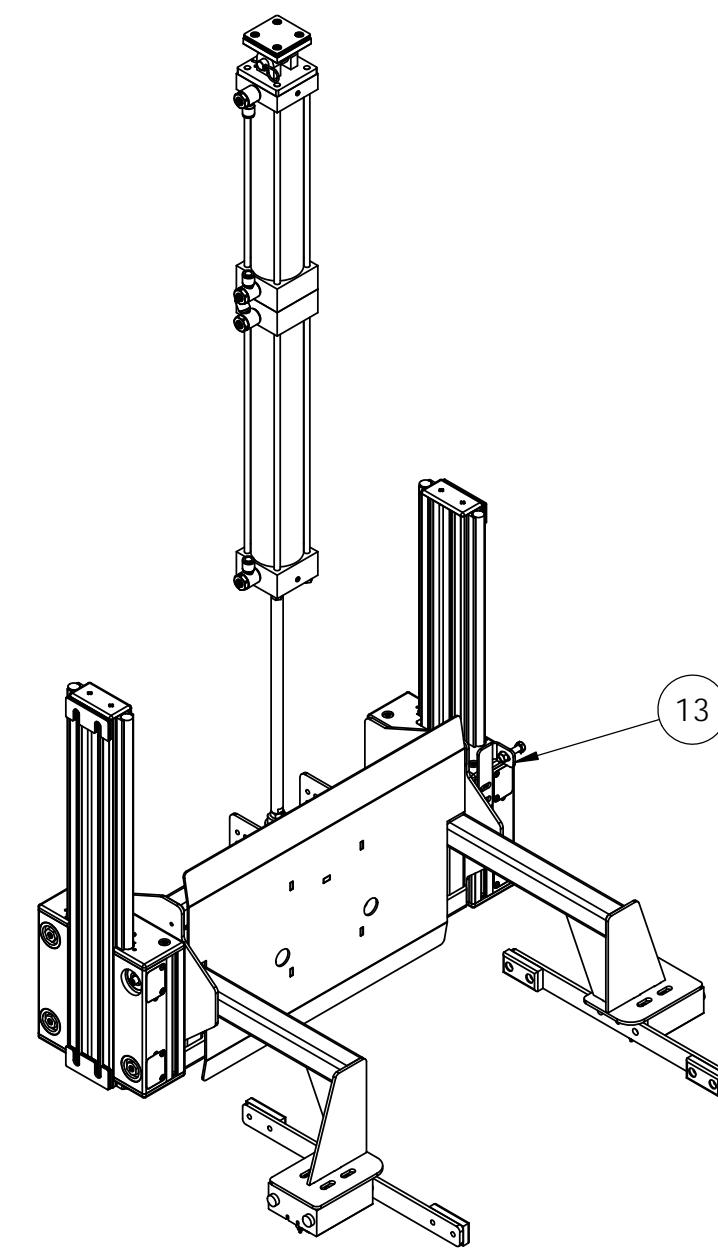
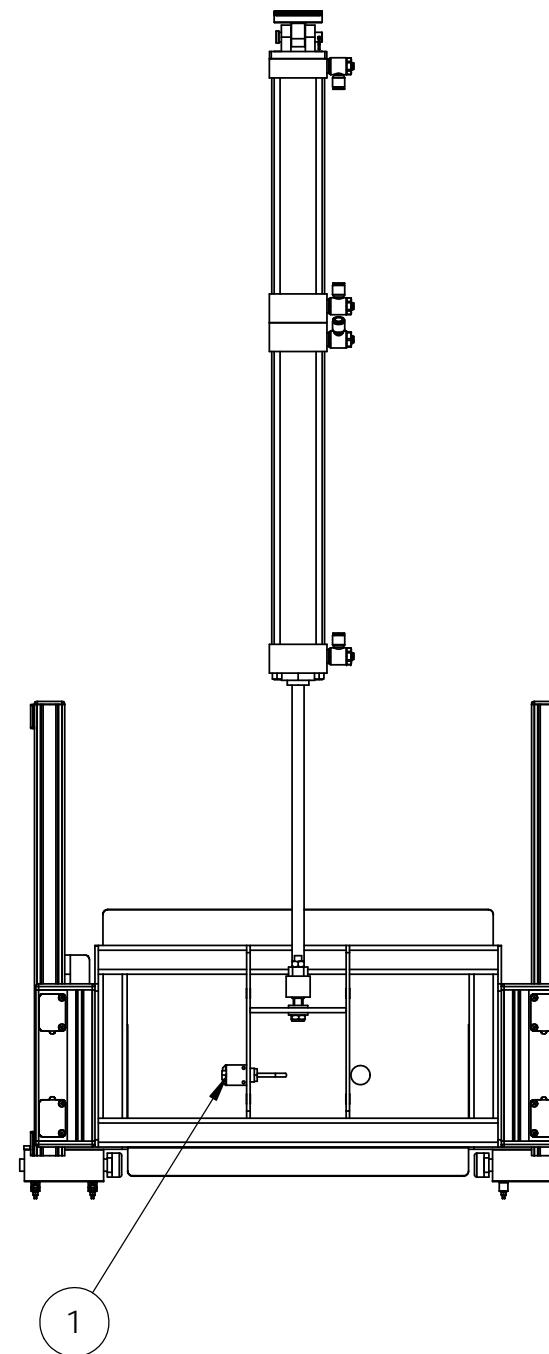
REV. DWG. NO.

ST3520-A004

WEIGHT: 198 LBS

DATE: 7/26/17 DRAWN BY: JVM 1:10 2 OF 3

CONFIDENTIAL AND PROPRIETARY
NOTE: THIS DRAWING AND THE INFORMATION SHOWN
ARE THE PROPERTY OF CONVEYOR CONCEPTS OF
MICHIGAN, LLC. WRITTEN PERMISSION IS REQUIRED
TO REPRODUCE THIS DRAWING OR ANY PART OF IT,
OR TO MANUFACTURE THE ITEMS DEPICTED.



:P1
:P2
:P3
:P4
:P5
:P6
:P7
:P8

DESTINATION: ASSEMBLY



PAINT COLOR: ORANGE 2004

QTY: JOB #:

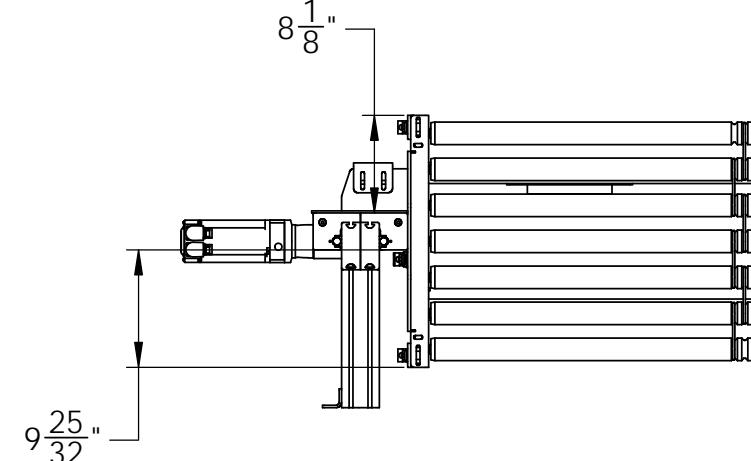
ASSEMBLY - DESTACKER

REV. DWG. NO.

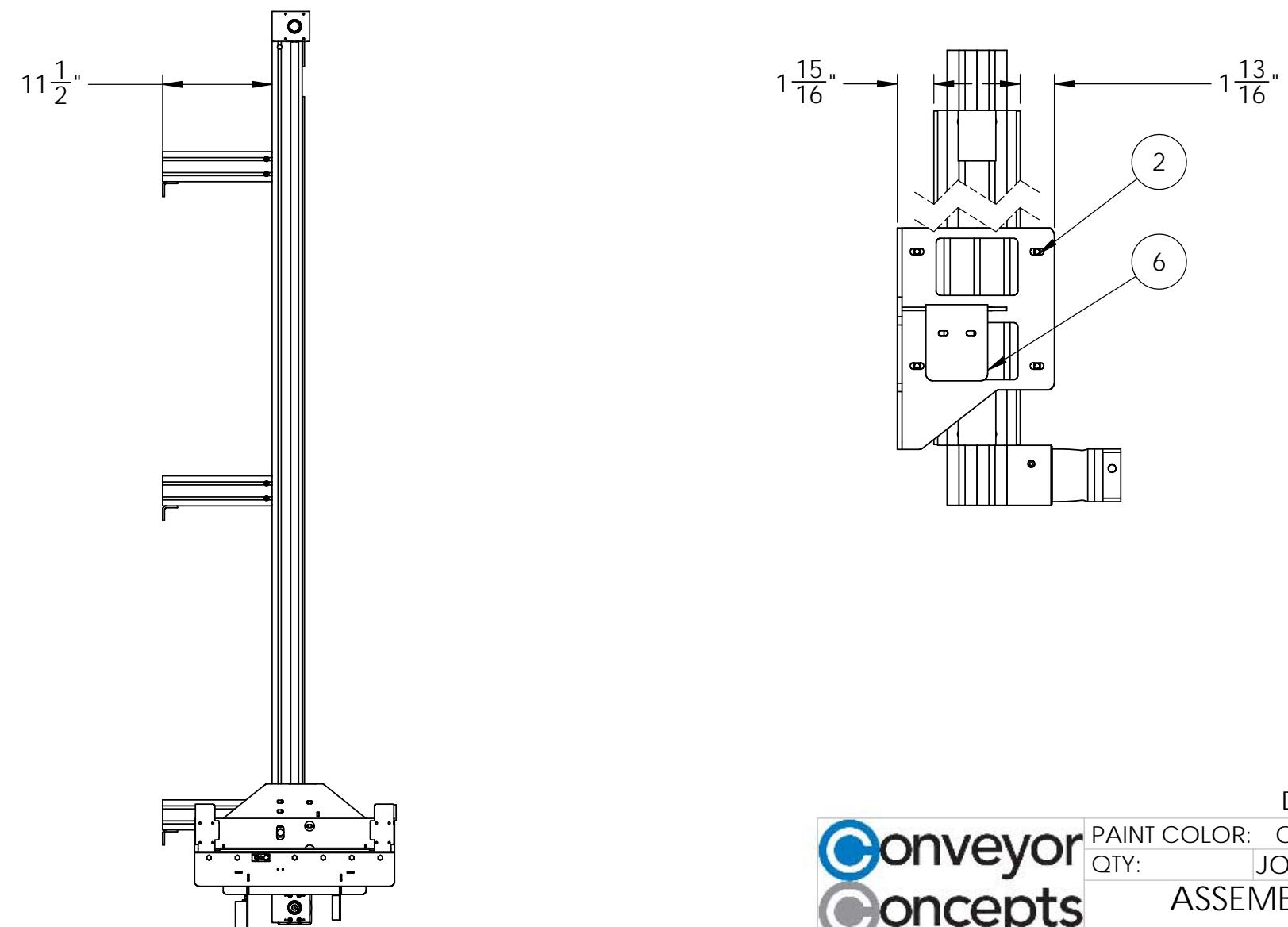
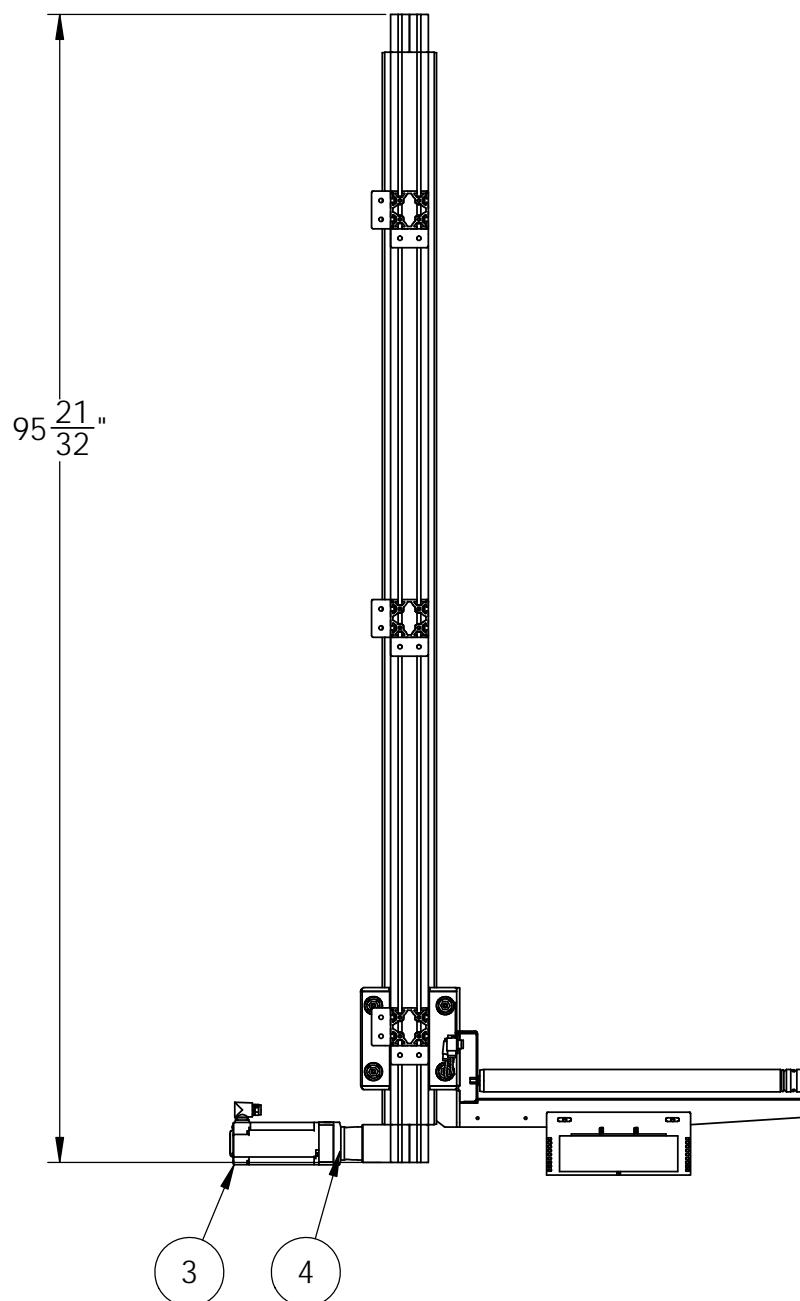
ST3520-A004

WEIGHT: 198 LBS

DATE: 7/26/17 DRAWN BY: JVM 1:10 3 OF 3



ITEM	QTY	PART#	DESCRIPTION	MATERIAL TYPE	LENGTH
1	1	2017-06-10589-101B	PALLETTI LINEAR ACTUATOR, 40X80X80-16/200MM LG. CARRIAGE, INTERNALLY TENSIONED BELT W/(3) STANOFFS	PURCHASE	
2	4	3917	80/20 ROLL IN T-NUT W/ BALL SPRNG, 5/16"-18 THREAD, #3917	PURCHASE	
3	1	MPL-B320P-MJ74AA	ALLEN BRADLEY SERVO MOTOR, W/BRAKE, 3.05NM, 460V, MT HRES ABSOLUTE ENODER	PURCHASE	
4	1	NP015S-MF1-7-0D1-1S	ALPHA WITTENSTEIN INLINE GEARBOX	PURCHASE	
5	1	ST3520-A006	ASSEMBLY - LIFT MDR	ASSEMBLY	
6	1	ST3520-D024	DETAIL - ENERGY CHAIN MOUNTING ANGLE	OUTSOURCE	



ASSEMBLY:
:P1
:P2
:P3
:P4
:P5
:P6
:P7
:P8

DESTINATION: ASSEMBLY



PAINT COLOR: ORANGE 2004

QTY: JOB #:

ASSEMBLY - LIFT MDR

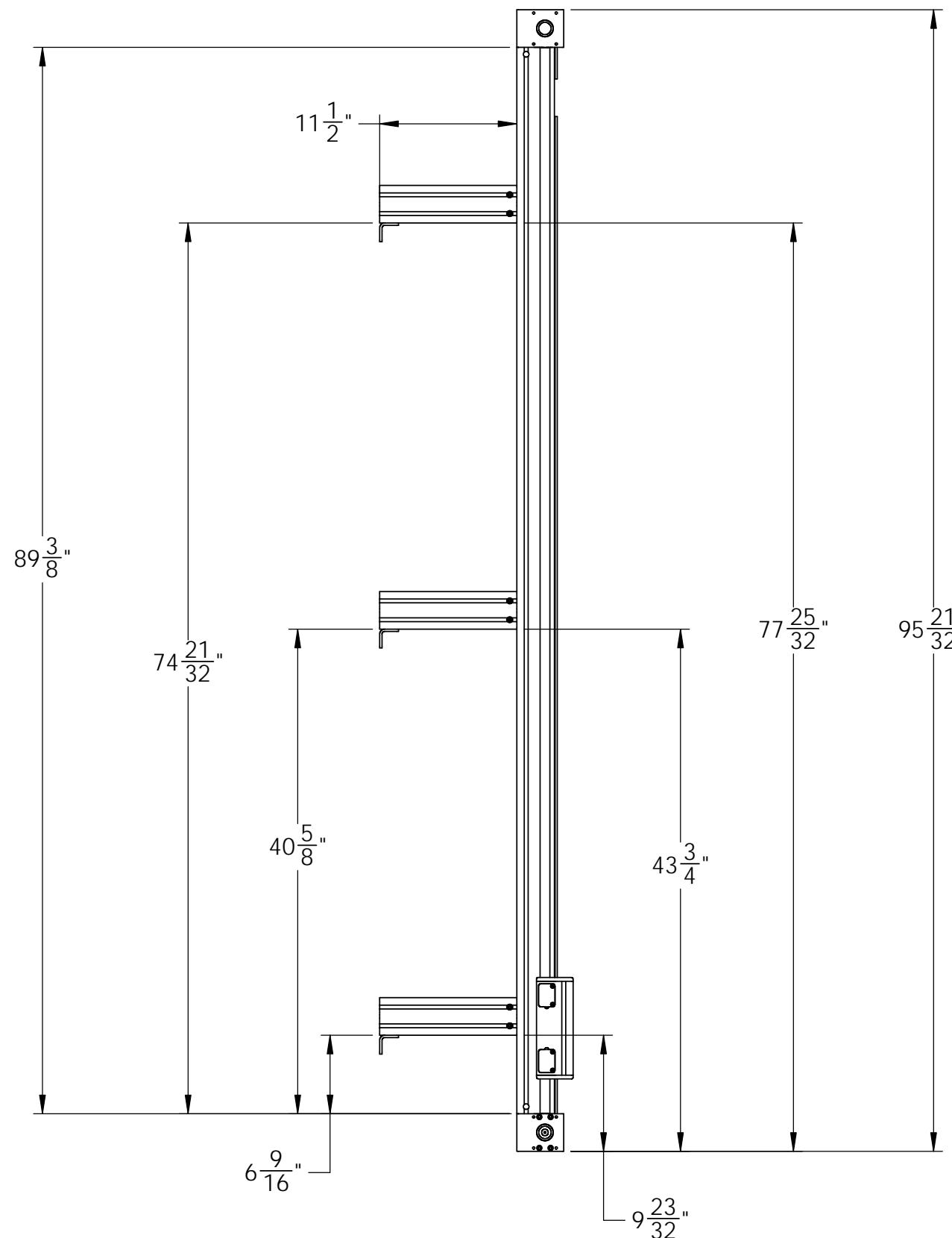
REV. DWG. NO.

ST3520-A005

WEIGHT: 343 LBS

DATE: 7/26/17 DRAWN BY: JVM 1:16 1 OF 2

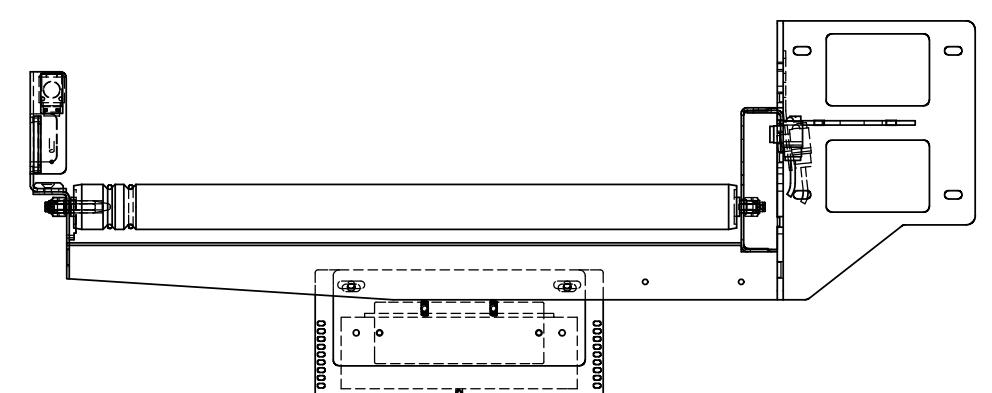
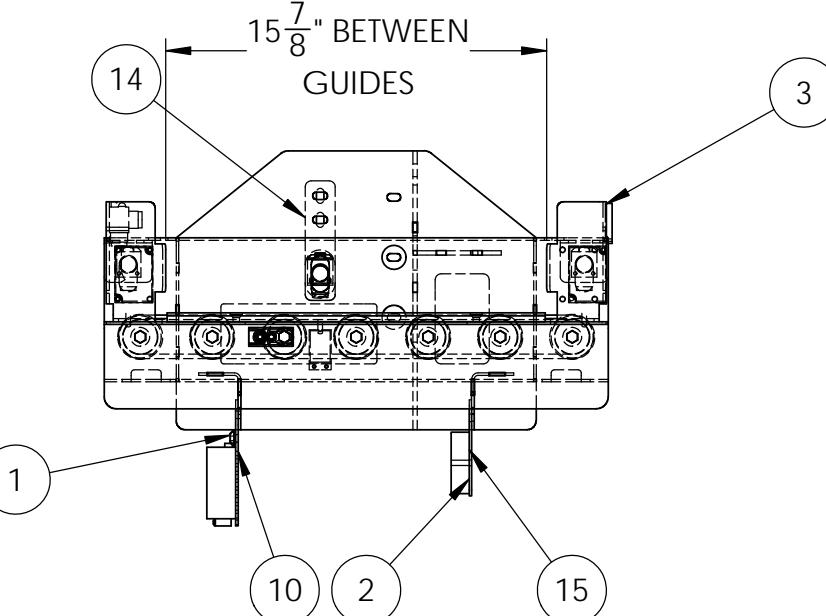
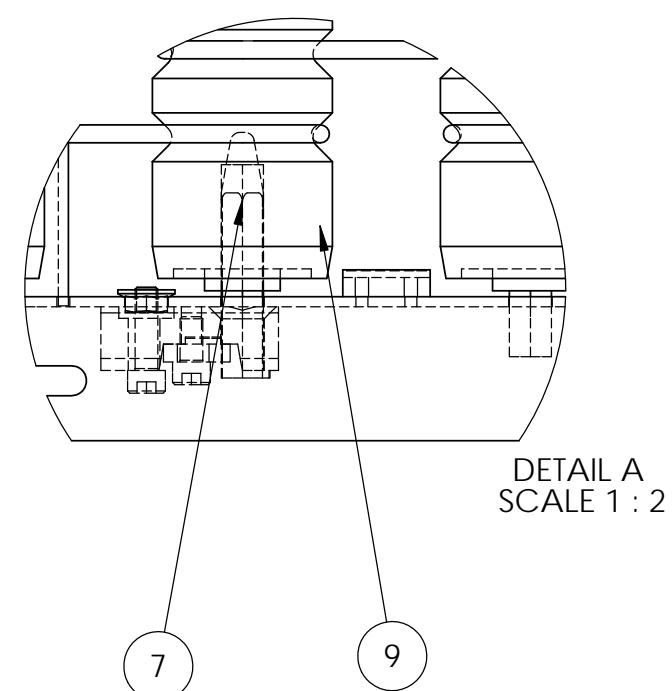
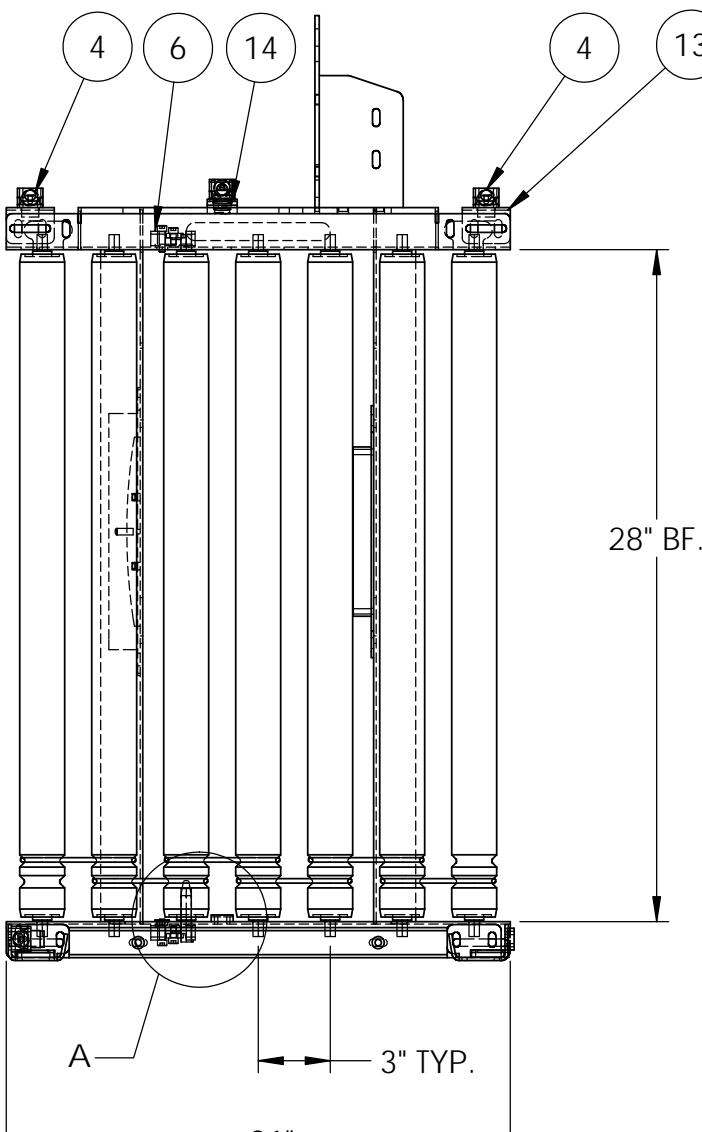
CONFIDENTIAL AND PROPRIETARY
NOTICE: This drawing and the design shown
are the property of CONVEYOR CONCEPTS OF
MICHIGAN, LLC. WRITTEN PERMISSION IS REQUIRED
TO REPRODUCE THIS DRAWING OR ANY PART OF IT,
OR TO MANUFACTURE THE ITEMS DEPICTED.



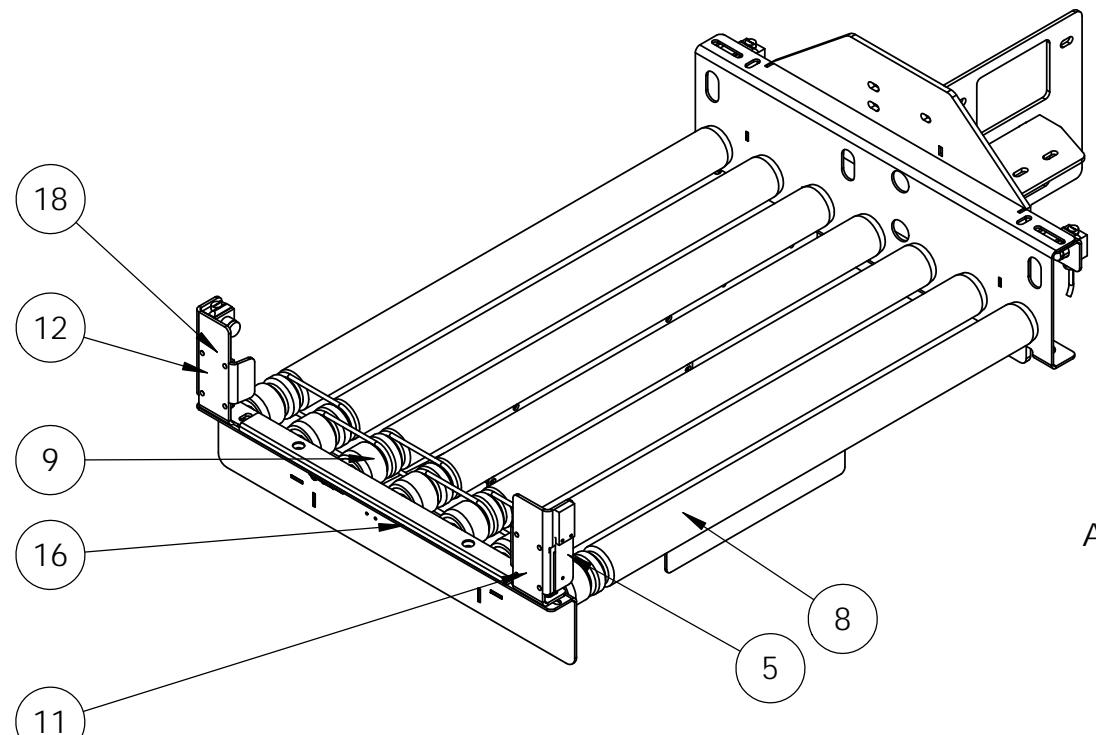
PAINT COLOR:	ORANGE 2004
QTY:	JOB #:
ASSEMBLY - LIFT MDR	
ST3520-A005	
REV.:	DWG. NO.
DATE: 7/26/17	DRAWN BY: JVM 1:12 2 OF 2

WEIGHT: 343 LBS

CONFIDENTIAL AND PROPRIETARY
NOTE: THIS DRAWING AND THE ITEM SHOWN
ARE THE PROPERTY OF CONVEYOR CONCEPTS OF
MICHIGAN, LLC. WRITTEN PERMISSION IS REQUIRED
TO REPRODUCE THIS DRAWING OR ANY PART OF IT,
OR TO MANUFACTURE THE ITEMS DEPICTED.



ITEM	QTY	PART#	DESCRIPTION	MATERIAL TYPE
1	2	14165	DROP IN T-NUT, 80/20 #14165, 1/4"-20 THREAD	PURCHASE
2	1	1732P-16CFGM12	ARMOR BLOCK, ALLEN BRADLEY #1732P-16CFGM12	BY OTHERS
3	2	92-93	REFLECTOR, ALLEN BRADLEY #92-93	BY OTHERS
4	4	Allen Bradley - 42EF-P2MPB-F4	PHOTO EYE, ALLEN BRADLEY RIGHT SIGHT 42EF-P2MPB-F4	BY OTHERS
5	6	G0201-EABA	1.9" SLAVE O-RING 3" CC .187 x 9-9/16" #0276646470	BY OTHERS
6	1	K0402-43AAA	POWERED ROLLER RETAINER K0402-43AAA	BY OTHERS
7	1	K0402-43BAA	POWERED ROLLER BRACKET, K0402-43BAA	BY OTHERS
8	6	S3483-21960_SIMPLE_28BF	ROLLER, 1.9G16HQ PAZ 2GRV, 27-5/16" SHELL LENGTH, 29-1/4" AXLE #S348327960	BY OTHERS
9	1	S360207081	ROLLER, 50MM CPLD PWR RLR, 693.7MM SHL, 2-GRV SGL, #S360207081	BY OTHERS
10	1	ST3520-D006	DETAIL - DRIVER CARD MOUNT	OUTSOURCE
11	1	ST3520-D020	DETAIL - REFLECTOR MOUNTING BRACKET	OUTSOURCE
12	1	ST3520-D021	DETAIL - REFLECTOR MOUNTING BRACKET	OUTSOURCE
13	2	ST3520-D022	DETAIL - PHOTOSWITCH MTG ANGLE	OUTSOURCE
14	1	ST3520-D057	DETAIL - PHOTOSWITCH MTG ANGLE	OUTSOURCE
15	1	ST3520-D143	DETAIL - I/O MOUNT	OUTSOURCE
16	1	ST3520-D301	DETAIL - LAUNCH RAMP	OUTSOURCE
17	1	ST3520-W313	WELDMENT - LIFT CARRAIGE	WELDMENT
18	2	Sick 101270	REFLECTOR, SICK 101270	BY OTHERS



ASSEMBLY: P1
P2
P3
P4
P5
P6
P7
P8

DESTINATION: ASSEMBLY

Conveyor Concepts
OF MICHIGAN, L.L.C.

PAINT COLOR: ORANGE 2004

QTY: JOB #:

ASSEMBLY - LIFT MDR

REV. DWG. NO.

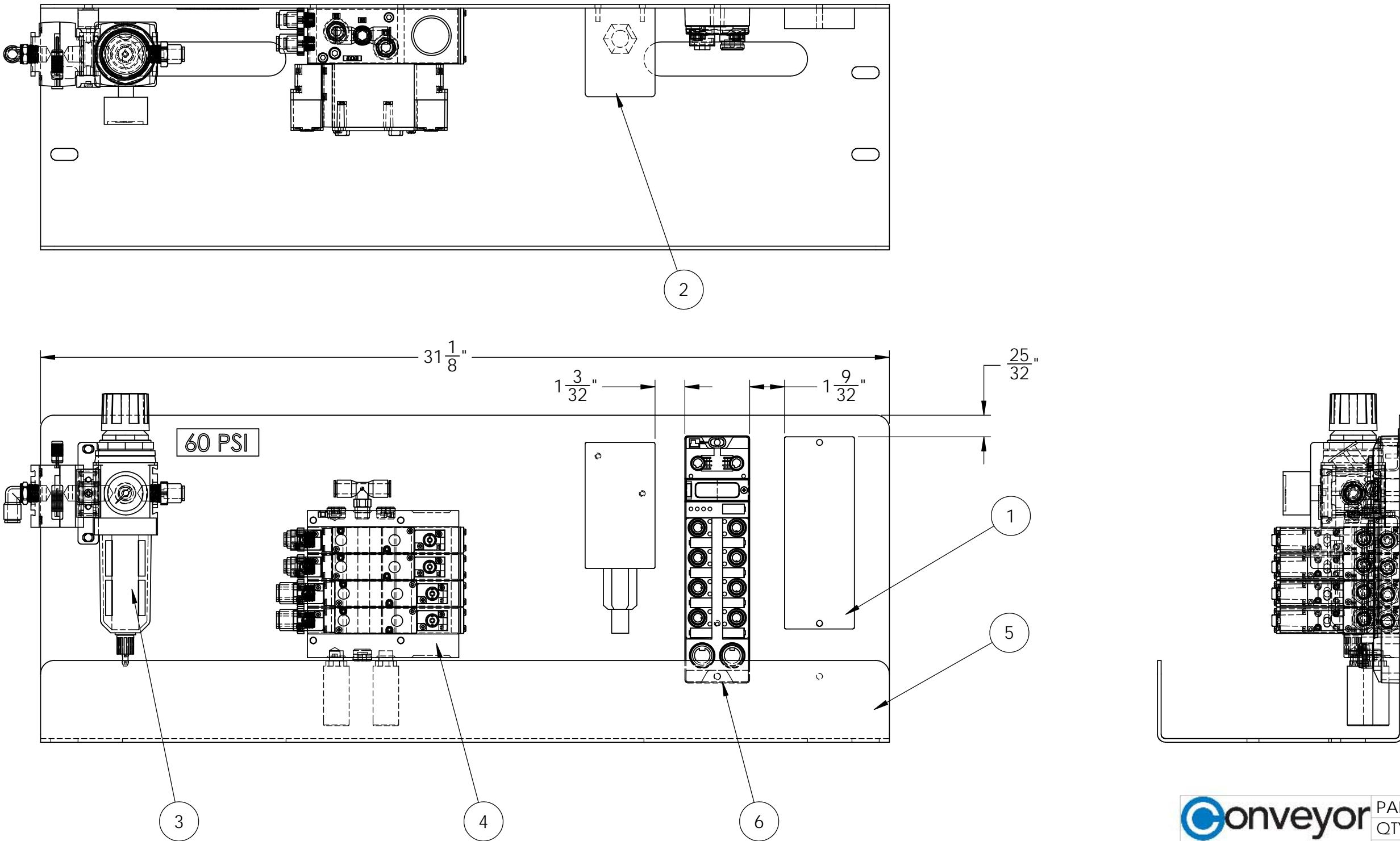
ST3520-A006

DATE: 7/26/17 DRAWN BY: JVM 1:8 1 OF 1

WEIGHT: 85 LBS

CONFIDENTIAL AND PROPRIETARY
NOTE: THIS DRAWING AND THE DESIGN SHOWN
ARE THE PROPERTY OF CONVEYOR CONCEPTS OF
MICHIGAN, LLC. WRITTEN PERMISSION IS REQUIRED
TO REPRODUCE THIS DRAWING OR ANY PART OF IT,
OR TO MANUFACTURE THE ITEMS DEPICTED.

ITEM	QTY	PART#	DESCRIPTION	MATERIAL TYPE
1	1	1732P-16CFGM12	ARMOR BLOCK, ALLEN BRADLEY #1732P-16CFGM12	BY OTHERS
2	1	836-C7A	PRESSURE CONTROL SWITCH, ALLEN BRADLEY, 836-NX77	BY OTHERS
3	1	NP08-14-1019	ASSEMBLY - REGULATOR	PURCHASE
4	1	NP08-14-1136	ASSEMBLY - VALVE BANK	PURCHASE
5	1	ST3520-D310	DETAIL - VALVE MOUNTING ANGLE	OUTSOURCE
6	1	STP-TBEN-L	TURCK I/O MODULE FOR ETHERNET	BY OTHERS



NOTE: 20FT - 3/8" DIA. POLYTUBING PER ASSEMBLY
100FT - 1/4" DIA. POLYTUBING PER ASSEMBLY
4 - 1/4" "Y" FITTINGS PER ASSEMBLY

WEIGHT: 87 LBS

Conveyor Concepts
OF MICHIGAN, L.L.C.

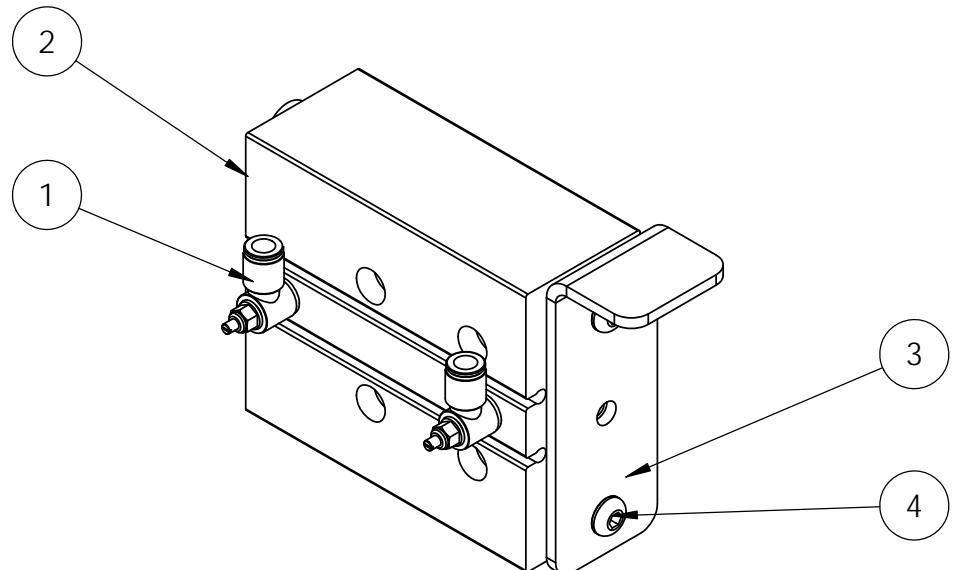
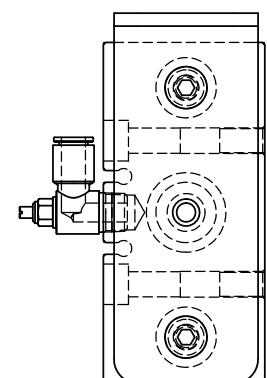
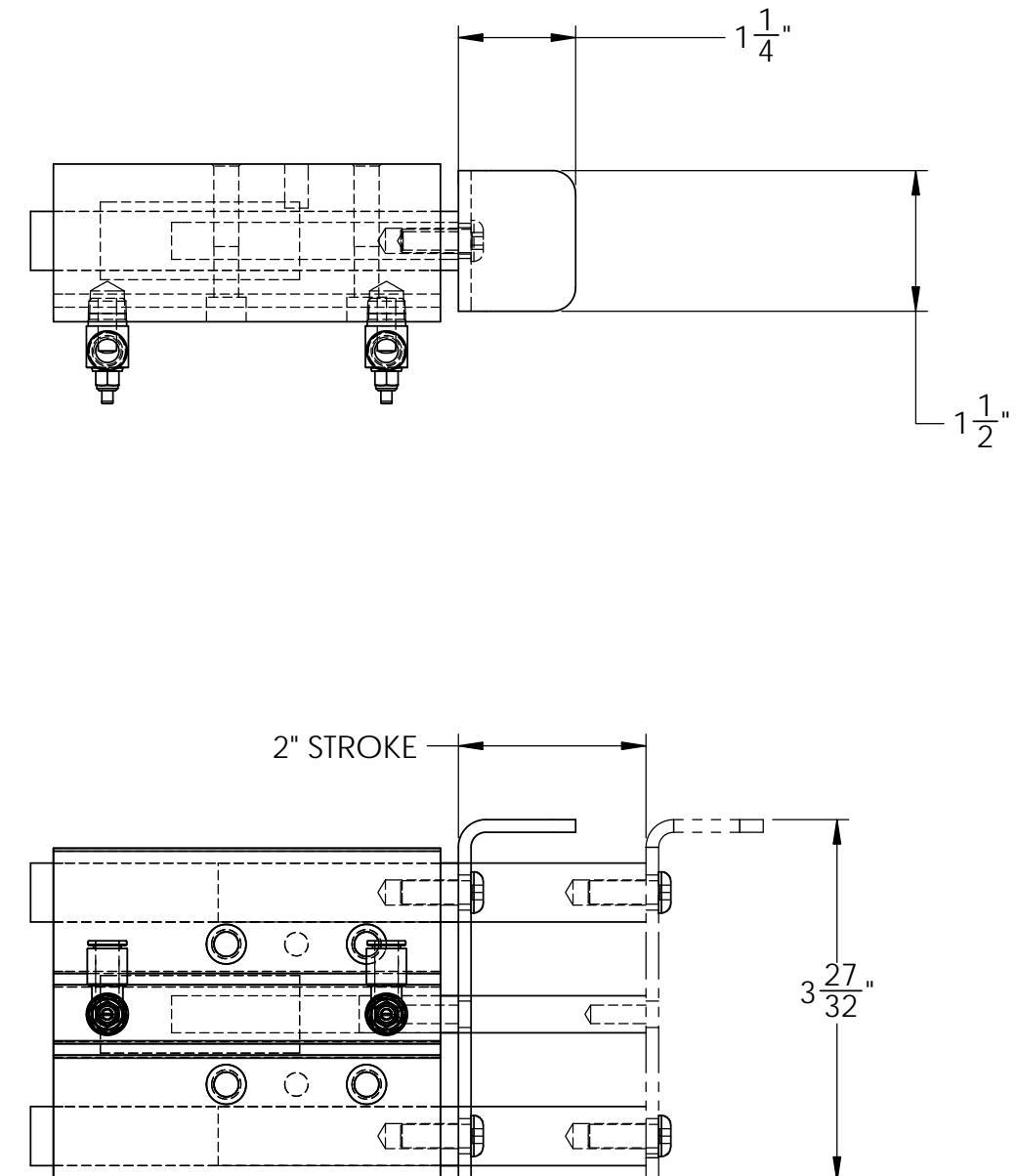
CONFIDENTIAL AND PROPRIETARY
NOTICE: THIS DRAWING AND THE DESIGN SHOWN
ARE THE PROPERTY OF CONVEYOR CONCEPTS OF
MICHIGAN, LLC. WRITTEN PERMISSION IS REQUIRED
TO REPRODUCE THIS DRAWING OR ANY PART OF IT,
OR TO MANUFACTURE THE ITEMS DEPICTED.

REV. DWG. NO.

ST3520-A011

DATE: 7/26/17 DRAWN BY: JVM 1:4 1 OF 1

ITEM	QTY	PART#	DESCRIPTION	MATERIAL TYPE
1	2	7625_56_11	7625 - FLOW CONTROL REGULATOR EXHAUST VERSION NPT 6.35, #7625 56 11, NPT1/8, 1/4 INC	PURCHASE
2	1	SAH125x2-M	PHD SAH SLIDE CYLINDER, 25MM BORE X 2" STROKE, CUSTOM BODY & TOOL, & BALLUFF #BMF00F9, V-TWIN SENSOR W/ M12 CONN.	PURCHASE
3	1	ST3520-D160	DETAIL - HOLD DOWN ANGLE	OUTSOURCE
4	2	BHSCS_1/4-20X0.750_BO	BHSCS 1/4"-20 X 3/4" LONG, BO	FASTENER



ASSEMBLY-OUTSOURCE:P1
:P2
:P3
:P4
:P5
:P6
:P7
:P8

DESTINATION: ASSEMBLY

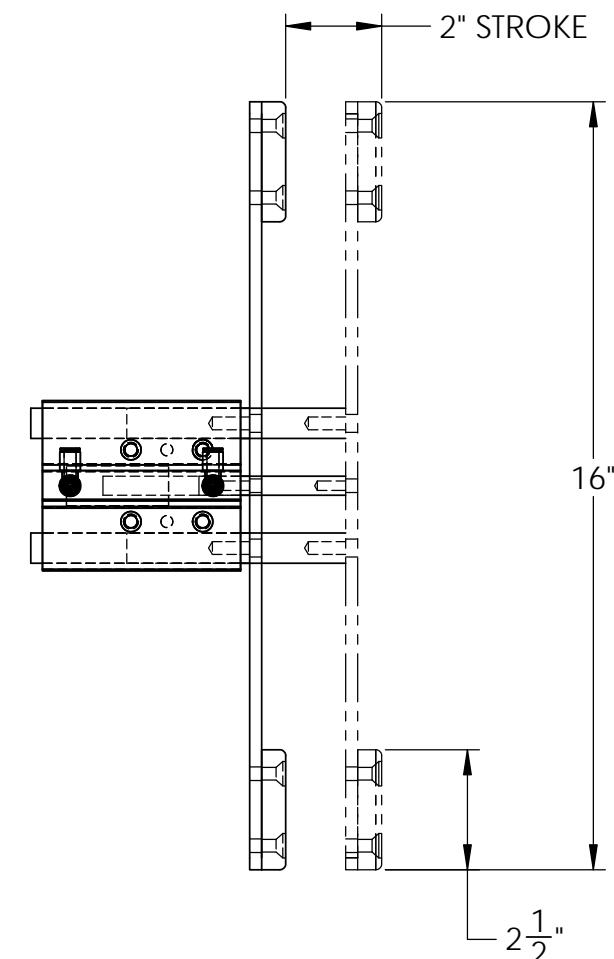


PAINT COLOR: NONE
QTY: JOB #:
ASSEMBLY - DESTACKER HOLD DOWN ARM, NP08-15-0070

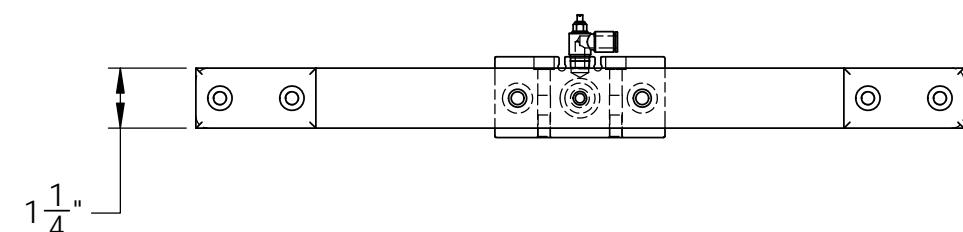
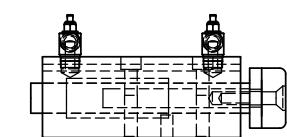
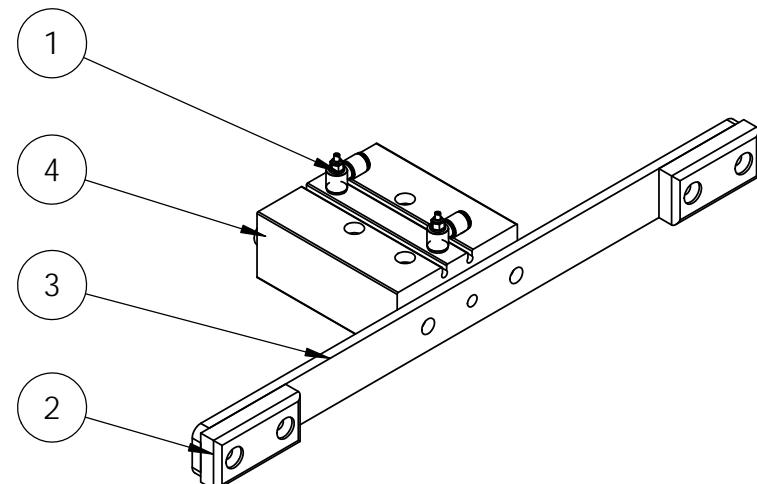
REV. DWG. NO. ST3520-A021
DATE: 7/26/17 DRAWN BY: JVM 1:2 1 OF 1

WEIGHT: 7 LBS

CONFIDENTIAL AND PROPRIETARY
NOTICE: This drawing and the design shown
are the property of CONVEYOR CONCEPTS OF
MICHIGAN, LLC. WRITTEN PERMISSION IS REQUIRED
TO REPRODUCE THIS DRAWING OR ANY PART OF IT,
OR TO MANUFACTURE THE ITEMS DEPICTED.



ITEM	QTY	PART#	DESCRIPTION	MATERIAL TYPE	LENGTH
1	2	7625_56_11	7625 - FLOW CONTROL REGULATOR EXHAUST VERSION NPT 6.35, #7625 56 11, NPT1/8, 1/4 INC	PURCHASE	
2	2	ST3520-D156	DETAIL - DESTACKER ALUMINUM CLAMP	OUTSOURCE	2 1/2"
3	1	ST3520-D157	DETAIL - DESTACKER CYLINDER PLATE	OUTSOURCE	
4	1	SAH125x2-M	PHD SAH SLIDE CYLINDER, 25MM BORE X 2" STROKE, CUSTOM BODY & TOOL, & BALLUFF #BMF00F9, V-TWIN SENSOR W/ M12 CONN.	PURCHASE	



ASSEMBLY-OUTSOURCE:P1
:P2
:P3
:P4
:P5
:P6
:P7
:P8

DESTINATION: ASSEMBLY



PAINT COLOR:	NONE
QTY:	JOB #:

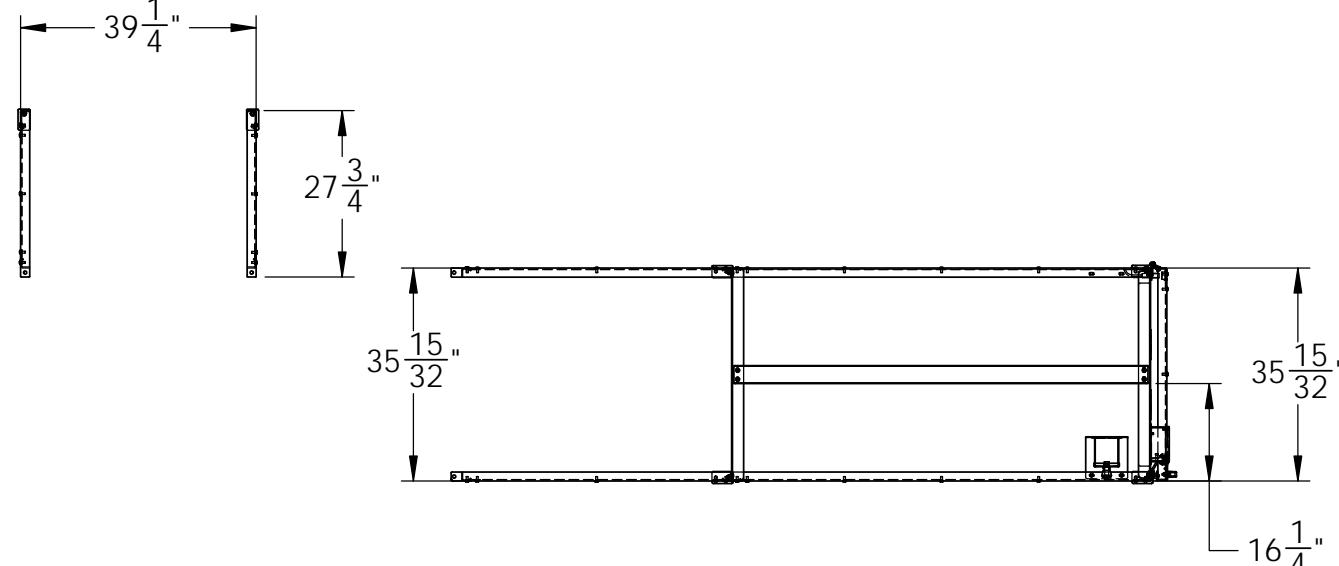
ASSEMBLY - DESTACKER CLAMP ARM, NP08-15-0071

REV. DWG. NO.

ST3520-A022

DATE: 7/26/17 DRAWN BY: JVM 1:4 1 OF 1

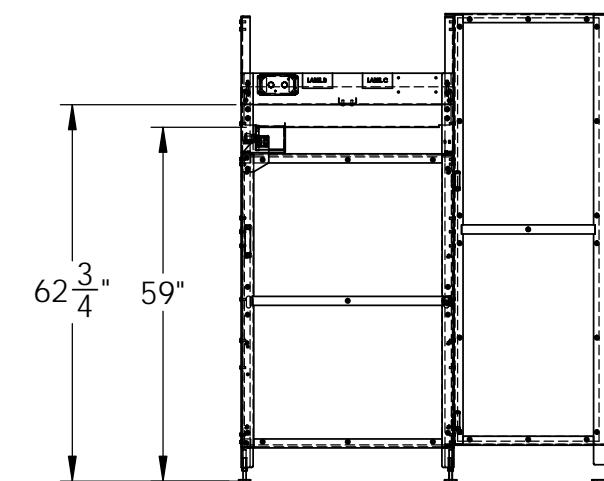
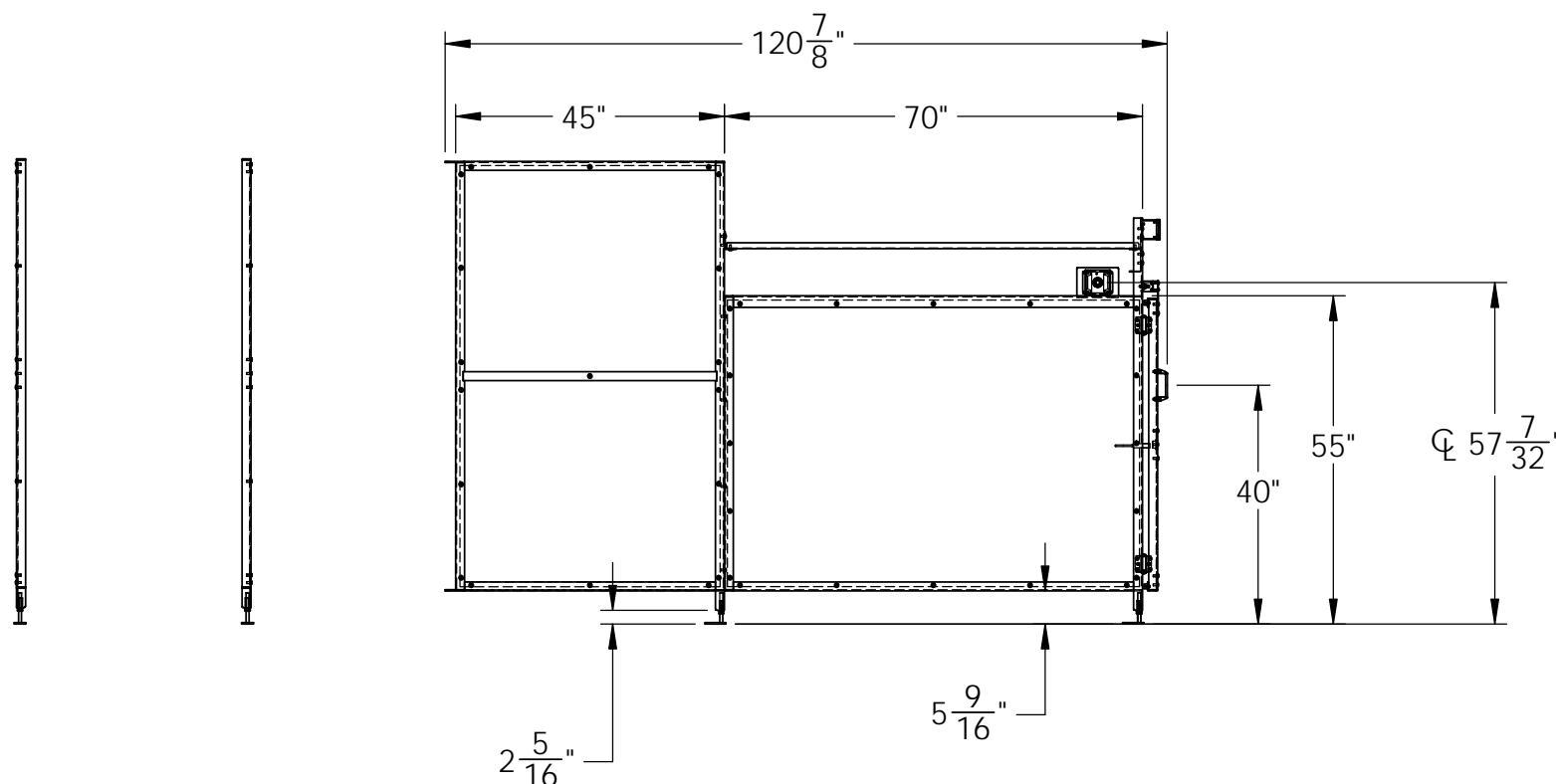
WEIGHT: 8 LBS



ITEM	QTY	PART#	DESCRIPTION	MATERIAL TYPE	LENGTH
1	1	BY OTHERS	PROX SWITCH, 18mm, (BY OTHERS)	BY OTHERS	
2	16	CB_5/16-18X0.75_ZP	CARRIAGE BOLT 5/16"-18 X 3/4" LONG ZP GRD5	FASTENER	
3	1	E1PBXM	PUSH BUTTON E-STOP	BY OTHERS	
4	1	E2PBG	PUSHBUTTON ENCLOSURE, TYPE 12	BY OTHERS	
5	2	HHCS_10-32X0.750_ZP	HHCS #10-32 X 3/4" LONG ZP GRD5	FASTENER	
6	2	HWN_10-32_ZP_G5	HEX WHIZ NUT, 10-32 UNC, ZP, G5	FASTENER	
7	1	N184-861	GATE LATCH	PURCHASE	
8	1	ST3520-A028	ASSEMBLY - GATE	ASSEMBLY	
9	1	ST3520-A305	ASSEMBLY - FENCE PANEL X 46 3/4", INFEED LEFT	ASSEMBLY	46 3/4"
10	1	ST3520-A306	ASSEMBLY - FENCE PANEL X 46 3/4", INFEED RIGHT	ASSEMBLY	46 3/4"
11	1	ST3520-A315	ASSEMBLY - BLOCKER ANGLE	ASSEMBLY	
12	1	ST3520-A510	ASSEMBLY - FENCE PANEL X 27 3/4"	ASSEMBLY	27 3/4"
13	1	ST3520-A511	ASSEMBLY - FENCE PANEL X 27 3/4"	ASSEMBLY	27 3/4"
14	1	ST3520-A519	ASSEMBLY - LEAD IN FENCE PANEL, INFEED LEFT	ASSEMBLY	
15	1	ST3520-A520	ASSEMBLY - LEAD IN FENCE PANEL, INFEED RIGHT	ASSEMBLY	
16	1	ST3520-D344	DETAIL - TOP SUPPORT	OUTSOURCE	35 1/2"
17	1	ST3520-D401	DETAIL - OVERSTACK CHANNEL	OUTSOURCE	69"
18	1	ST3520-D403	DETAIL - BLOCKER ANGLE	OUTSOURCE	34 1/2"
19	1	ST3520-D567	DETAIL - E STOP MTG BRACKET	OUTSOURCE	

ITEM	QTY	PART#	DESCRIPTION	MATERIAL TYPE	LENGTH
20	1	ST3520-D377	DETAIL - VT PHOTO EYE BRACKET	OUTSOURCE	
21	1	ST3520-D378	DETAIL - VT REFLECTOR BRACKET	OUTSOURCE	
22	1	ST3520-D558	DETAIL - RACK PANEL 1	OUTSOURCE	
23	1	ST3520-D559	DETAIL - RACK PANEL 2	OUTSOURCE	

ITEMS NOT SHOWN



PACKAGING:
P1
P2
P3
P4
P5
P6
P7
P8

DESTINATION: SHIPPING

PAINT COLOR: YELLOW 1021
QTY: JOB #:
ASSEMBLY - INFEED FENCING
RH ASSEMBLY

Conveyor Concepts
OF MICHIGAN, L.L.C.

CONFIDENTIAL AND PROPRIETARY
NOTE: THIS DRAWING AND THE INFORMATION CONTAINED
HEREIN ARE THE PROPERTY OF CONVEYOR CONCEPTS OF
MICHIGAN, LLC. WRITTEN PERMISSION IS REQUIRED
TO REPRODUCE THIS DRAWING OR ANY PART OF IT,
OR TO MANUFACTURE THE ITEMS DEPICTED.

REV. DWG. NO.

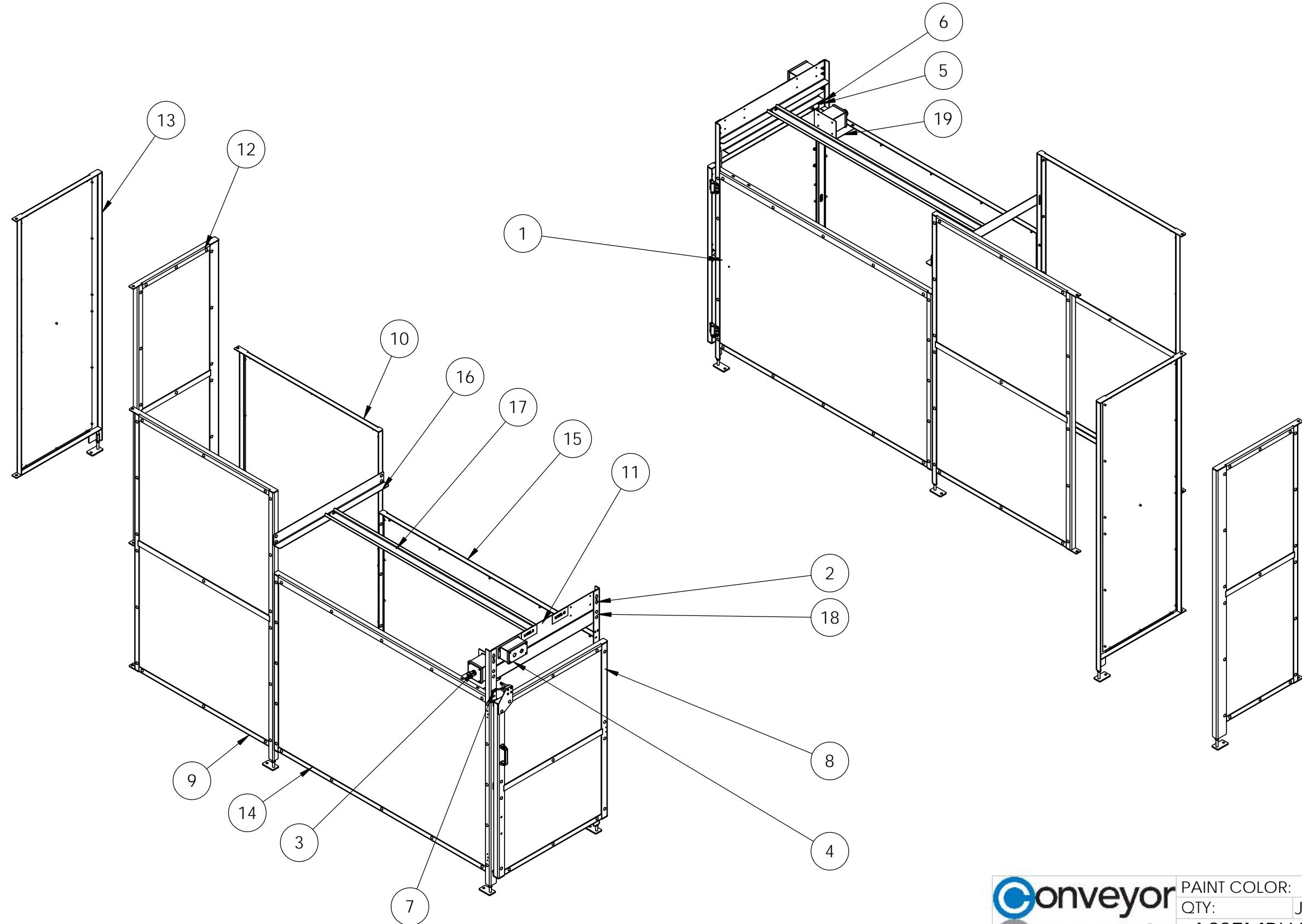
ST3520-A405

DATE: 7/26/17 DRAWN BY: JVM 1:32 1 OF 2

NOTE:
ITEMS ST3520-D377
ST3520-D378
ST3520-D567

SHIP ATTACHED TO ST3520-D550

WEIGHT: 396 LBS



PACKAGING:
P1
P2
P3
P4
P5
P6
P7
P8

DESTINATION: SHIPPING



PAINT COLOR: YELLOW 1021

QTY: JOB #:

ASSEMBLY - INFEED FENCING
RH ASSEMBLY

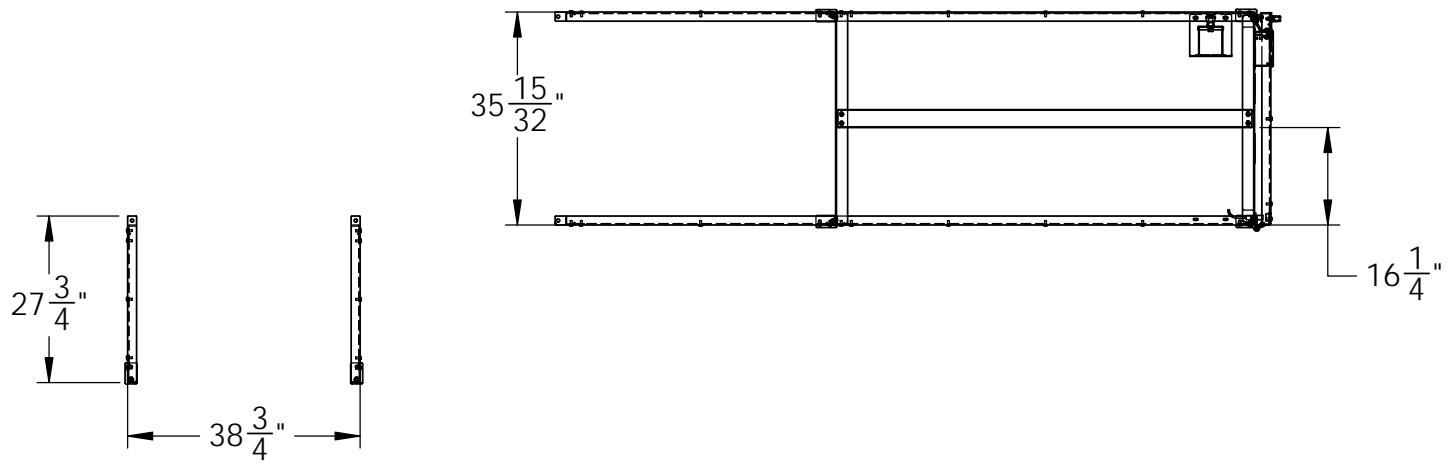
REV. DWG. NO.

ST3520-A405

WEIGHT: 396 LBS

DATE: 7/26/17 DRAWN BY: JVM 1:24 2 OF 2

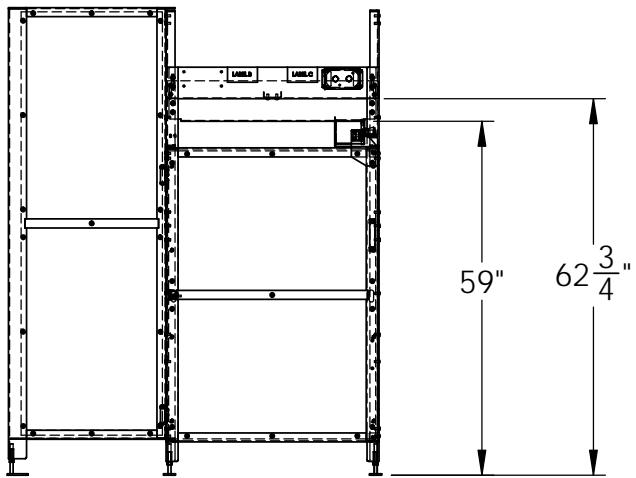
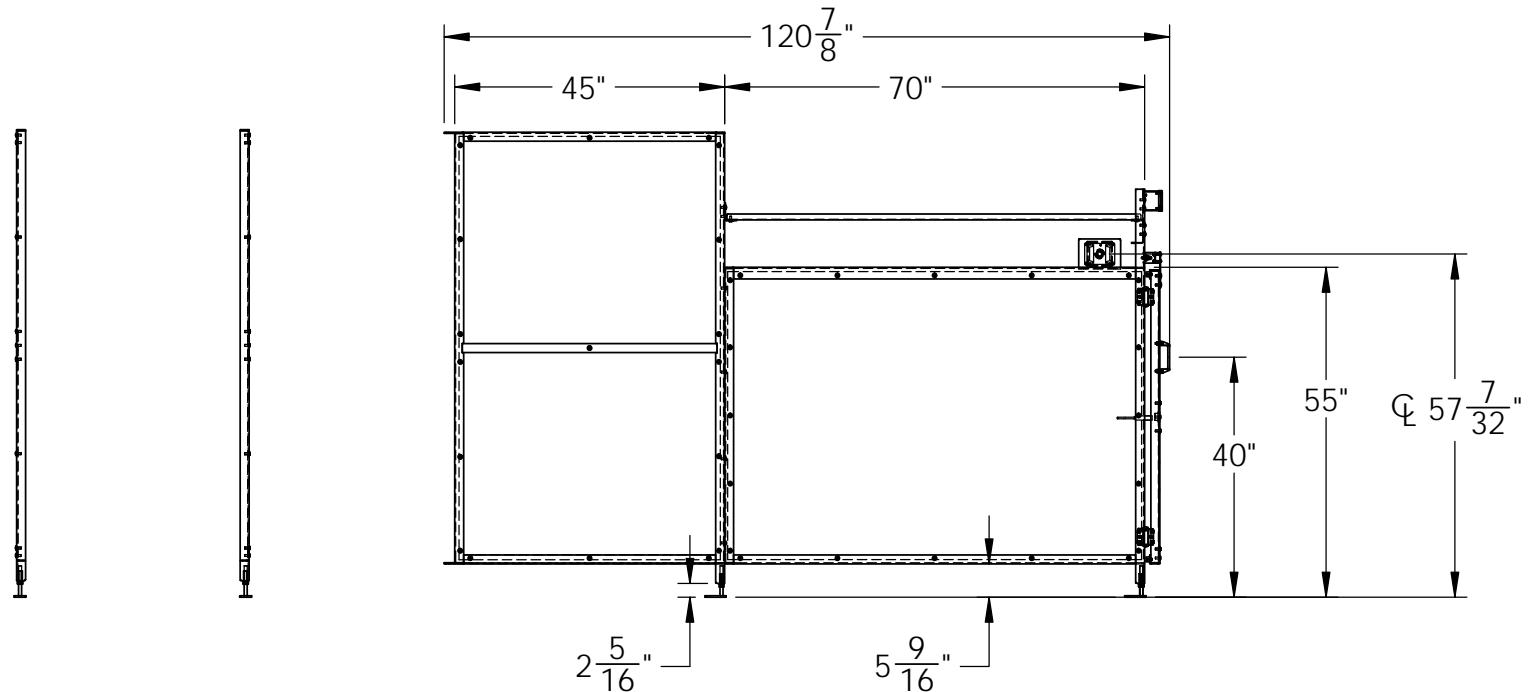
CONFIDENTIAL AND PROPRIETARY
NOTE: THIS DRAWING AND THE DESIGN SHOWN
ARE THE PROPERTY OF CONVEYOR CONCEPTS OF
MICHIGAN, LLC. WRITTEN PERMISSION IS REQUIRED
TO REPRODUCE THIS DRAWING OR ANY PART OF IT,
OR TO MANUFACTURE THE ITEMS DEPICTED.



ITEM	QTY	PART#	DESCRIPTION	MATERIAL TYPE	LENGTH
1	1	BY OTHERS	PROX SWITCH, 18mm, (BY OTHERS)	BY OTHERS	
2	16	CB_5/16-18X0.75_ZP	CARRIAGE BOLT 5/16"-18 X 3/4" LONG ZP GRD5	FASTENER	
3	1	E1PBXM	PUSH BUTTON E-STOP	BY OTHERS	
4	1	E2PBG	PUSHBUTTON ENCLOSURE, TYPE 12	BY OTHERS	
5	2	HHCS_10-32X0.750_ZP	HHCS #10-32 X 3/4" LONG ZP GRD5	FASTENER	
6	2	HWN_10-32_ZP_G5	HEX WHIZ NUT, 10-32 UNC, ZP, G5	FASTENER	
7	1	N184-861	GATE LATCH	PURCHASE	
8	1	ST3520-A028	ASSEMBLY - GATE	ASSEMBLY	
9	1	ST3520-A305	ASSEMBLY - FENCE PANEL X 46 3/4", INFEED LEFT	ASSEMBLY	46 3/4"
10	1	ST3520-A306	ASSEMBLY - FENCE PANEL X 46 3/4", INFEED RIGHT	ASSEMBLY	46 3/4"
11	1	ST3520-A315	ASSEMBLY - BLOCKER ANGLE	ASSEMBLY	
12	1	ST3520-A510	ASSEMBLY - FENCE PANEL X 27 3/4"	ASSEMBLY	27 3/4"
13	1	ST3520-A511	ASSEMBLY - FENCE PANEL X 27 3/4"	ASSEMBLY	27 3/4"
14	1	ST3520-A519	ASSEMBLY - LEAD IN FENCE PANEL, INFEED LEFT	ASSEMBLY	
15	1	ST3520-A520	ASSEMBLY - LEAD IN FENCE PANEL, INFEED RIGHT	ASSEMBLY	
16	1	ST3520-D344	DETAIL - TOP SUPPORT	OUTSOURCE	35 1/2"
17	1	ST3520-D401	DETAIL - OVERSTACK CHANNEL	OUTSOURCE	69"
18	1	ST3520-D403	DETAIL - BLOCKER ANGLE	OUTSOURCE	34 1/2"
19	1	ST3520-D567	DETAIL - E STOP MTG BRACKET	OUTSOURCE	

ITEM	QTY	PART#	DESCRIPTION	MATERIAL TYPE	LENGTH
20	1	ST3520-D377	DETAIL - VT PHOTO EYE BRACKET	OUTSOURCE	
21	1	ST3520-D378	DETAIL - VT REFLECTOR BRACKET	OUTSOURCE	
22	1	ST3520-D558	DETAIL - RACK PANEL 1	OUTSOURCE	
23	1	ST3520-D559	DETAIL - RACK PANEL 2	OUTSOURCE	

ITEMS NOT SHOWN



PACKAGING:
P1
P2
P3
P4
P5
P6
P7
P8

DESTINATION: SHIPPING

PAINT COLOR: YELLOW 1021
QTY: JOB #:
ASSEMBLY - INFEED FENCING
LH ASSEMBLY

Conveyor Concepts
OF MICHIGAN, L.L.C.

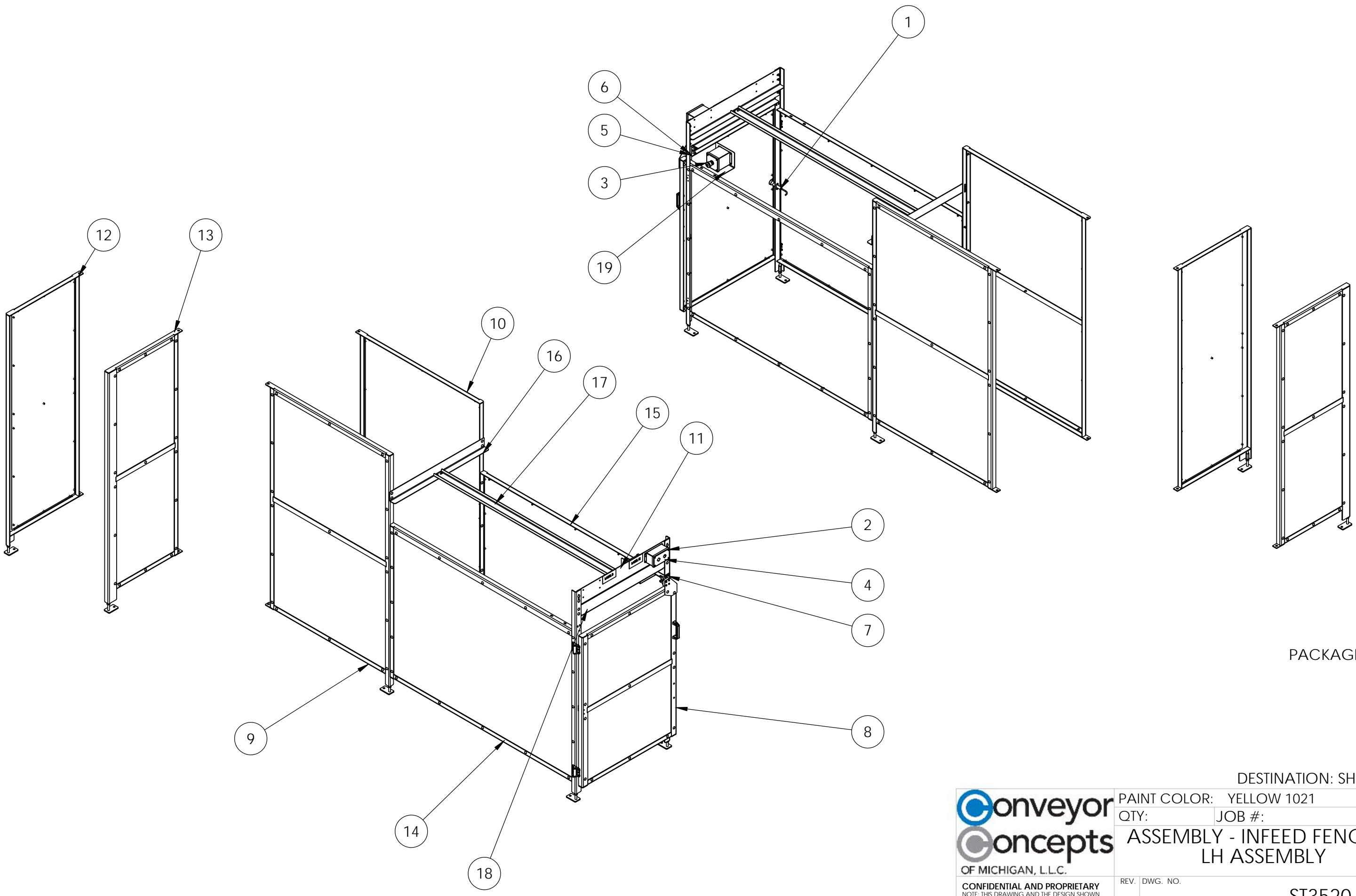
CONFIDENTIAL AND PROPRIETARY
NOTE: THIS DRAWING AND THE DESIGN SHOWN
ARE THE PROPERTY OF CONVEYOR CONCEPTS OF
MICHIGAN, LLC. WRITTEN PERMISSION IS REQUIRED
TO REPRODUCE THIS DRAWING OR ANY PART OF IT,
OR TO MANUFACTURE THE ITEMS DEPICTED.

REV. DWG. NO. ST3520-A406
DATE: 7/26/17 DRAWN BY: JVM 1:32 1 OF 2

NOTE:
ITEMS ST3520-D377
ST3520-D378
ST3520-D567

SHIP ATTACHED TO ST3520-D550

WEIGHT: 396 LBS



PACKAGING: P1
:P2
:P3
:P4
:P5
:P6
:P7
:P8

DESTINATION: SHIPPING

PAINT COLOR: YELLOW 1021

QTY: JOB #:

ASSEMBLY - INFEED FENCING
LH ASSEMBLY

**Conveyor
Concepts**
OF MICHIGAN, L.L.C.

CONFIDENTIAL AND PROPRIETARY
NOTE: THIS DRAWING AND THE DESIGN SHOWN
ARE THE PROPERTY OF CONVEYOR CONCEPTS OF
MICHIGAN, LLC. WRITTEN PERMISSION IS REQUIRED
TO REPRODUCE THIS DRAWING OR ANY PART OF IT,
OR TO MANUFACTURE THE ITEMS DEPICTED.

REV. DWG. NO.

ST3520-A406

DATE: 7/26/17 DRAWN BY: JVM 1:24 2 OF 2

WEIGHT: 396 LBS

"
"
"
"
"

CO C\ QP 'VQVG'F GUVCEMGT'CPF'"
NKHV'WP KV"
UV5742"

/Uwcpf ctf 'CTUCY 'I GP '702/"

"
"
"
"
"

RTGXGP VKKG'O CKP VGP CPEG"
UEJ GF WNG"

"
"
"
"
"
"
"
"
"
"

Preventive Maintenance Schedule - Rev 01

Component	Suggested Action	Weekly	Monthly	Quarterly	6 Months
All	Clean Check for loose fasteners Check for physical damage, replace worn or damaged components as required				
Motor & Gear Reducer	Check for noise Check mounting bolt torque *See note #3 Re-Torque and Check - Servo motor clamp hub torque (124 In Lbs) *See note #3 Re-Torque and Check - Gear box to Paletti Clamping Hub (71 In Lbs, Aluminum) *See note #3 Note: If connection is damaged replace hub and clean gear head output shaft Re-Torque and Check - Gear box to Paletti expansion coupling (106 In Lbs) *See note #3 Notes: 1) De-Oil all shafts, clamp hubs, and expansion couplings prior to assembly 2) Refer to Alpha/Wittenstein manual pages for additional details 3) Check minimum every 500 hrs run time				
Paletti - Lift	Check for noise Inspect guide rails for rust or un-even wear Felt Pads in Wiper-Lube Unit - Verify pads are moist with #2 Way Oil or synthetic food grade lubricant for SS applications Replace Wiper-Lube Unit *See note #2 Notes: 1) Refer to Paletti manual pages for additional information 2) Replace minimum every 2,000 hrs run time				
Paletti - Empty Tote	Check for noise Inspect carriages, guides, and rails for wear or damage, replace as required				
Alignment Coupler On Empty Tote Carriage	Check Jam nut to Alignment Coupler connection - Confirm jam nut is locked/tight				
Air Actuators & Pneumatic System	Check for noise Check mounting bolts Check airlines and connections for leaks or damaged components Empty moisture from sediment bowl				
Structural	Check for loose fasteners Check for physical damage				
Rollers	Check for noise Check for wear, replace as required				
Guide Rollers	Check for noise Check mounting bolts Check for wear, replace as required				
UHMW Guides	Check for wear, replace as required Check for loose fasteners				
Belts	Check for physical damage, replace as required				

卷之三

**CO C\ QP 'VQVG'F GUVCEMGT'CP F"
NKHV'WP KV"
UV5742"**

/Uwcpf ctf 'CTUCY 'I GP '7Ω//"

二〇四

URCT G'RCT VU'NKUV''

Üŋçä } ÄFÄE BEI EOEFI ÄÜçä åæå ÄÜÜCEY ÄUVHÍ FEOÖÖPÄ

Ü^çã } ÁEFÁÉI BE ÞDEFÍ ÁÙææ áæåÁÜÙCY ÁJVHÍ F€ÓÒp Á-

"
"
"
"
"
"
CO C\ QP 'VQVG'F GUVCEMGT'CPF'"
NKHV'WP KV"
UV5742"
/Uwcpf ctf 'CTUCY 'I GP '702/"
"
"
"
"
"
"
RCTV'EW'UJ GGVU'
"
"
"
"
"



WITTENSTEIN

alpha

LP⁺/ LPB⁺

Operating Manual



Revision history

Revision	Date	Comment	Chapter
01	20.01.03	new version	all
02	16.01.07	technical data updated	6.4.1
03	22.12.08	technical data updated Layout WITTENSTEIN	all
04	01.08.09	Machinery Directive	1, 2, 3, 4, 6
05	07.09.10	technical data updated	5.4, 9.1

Service

In case you have technical questions,
please contact:

WITTENSTEIN alpha GmbH

Customer Service
Walter-Wittenstein-Straße 1
D-97999 Igelsheim

Tel.: +49 7931 493-10900

Fax: +49 7931 493-10903

E-mail: service-alpha@wittenstein.de

© WITTENSTEIN alpha GmbH 2010

This documentation is copyright protected.

WITTENSTEIN alpha GmbH reserves all the rights to photo-mechanical reproduction,
copying, and the distribution by special processes (such as computers, file media, data
networks), even in parts.

Subject to technical and content changes without notice.

Contents

1	Regarding this manual.....	2
1.1	Signal words	2
1.2	Safety symbols.....	2
1.3	Design of the safety instructions	3
1.4	Information symbols.....	3
2	Safety.....	4
2.1	EC – Machinery directive	4
2.2	Dangers	4
2.3	Personnel	4
2.4	Intended use	4
2.5	Reasonably predictable misuse	4
2.6	Guarantee and liability	4
2.7	General safety instructions	5
3	Description of the gearbox.....	6
3.1	Overview of the gearbox components	6
3.1.1	Overview of the gearbox components LP ⁺	6
3.1.2	Overview of the gearbox components LPB ⁺	6
3.2	Type plate	7
3.3	Ordering key	7
3.4	Performance statistics.....	8
3.5	Weight.....	8
4	Transport and storage	9
4.1	Scope of delivery	9
4.2	Packaging	9
4.3	Transport.....	9
4.4	Storage	9
5	Assembly	10
5.1	Preparations.....	10
5.2	Mounting the gearbox to a machine (LPB ⁺).....	11
5.3	Mounting the motor onto the gearbox (LP ⁺ / LPB ⁺).....	12
5.3.1	Pre-mounting adapter plate (only LPB ⁺)	12
5.3.2	Mounting the motor (LP ⁺ / LPB ⁺)	13
5.4	Mounted components on the gear output side	14
5.4.1	Mountings on the output flange (LPB ⁺)	14
5.5	Mounting the gearbox to a machine (LP ⁺)	15
6	Startup and operation	16
7	Maintenance and disposal.....	17
7.1	Maintenance work	17
7.1.1	Visual inspection	17
7.1.2	Checking the tightening torques	17
7.2	Startup after maintenance work	17
7.3	Maintenance schedule	17
7.4	Notes on the lubricant used	18
7.5	Disposal	18
8	Malfunctions	19
9	Appendix	20
9.1	Specifications on mounting onto a motor	20
9.2	Specifications on mounting onto a machine	20
9.3	Tightening torques for common thread sizes in general mechanics	21

1 Regarding this manual

These instructions contain necessary information for the safe operation of the planetary gearhead LP⁺/LPB⁺, referred to as gearhead in the following.

The operator must make sure that this operating manual is read through by all persons assigned to install, operate, or maintain the gearhead, and that they understand them.

Store these instructions within reach near the gearhead.

These **safety instructions** should be shared with colleagues working in the vicinity of the device to ensure individual safety.

The original instructions were prepared in German; all other language versions are translations of these instructions.

1.1 Signal words

The following signal words are used to bring your attention to dangers, prohibitions, and important information:

	⚠ DANGER
This signal word points to an imminent danger that can cause serious injuries and even death.	
	⚠ WARNING
This signal word points to a possible danger that can cause serious injuries and even death.	
	⚠ CAUTION
This signal word points to a possible danger that can cause slight to serious injuries.	
	NOTICE
This signal word points to a possible danger that can cause material damage.	
	A note without signal word draws your attention to application tips or especially important information when handling the gearhead.

1.2 Safety symbols

The following safety symbols are used to bring your attention to dangers, prohibitions, and important information:



General danger



Hot surface



Suspended loads



Danger of being pulled in



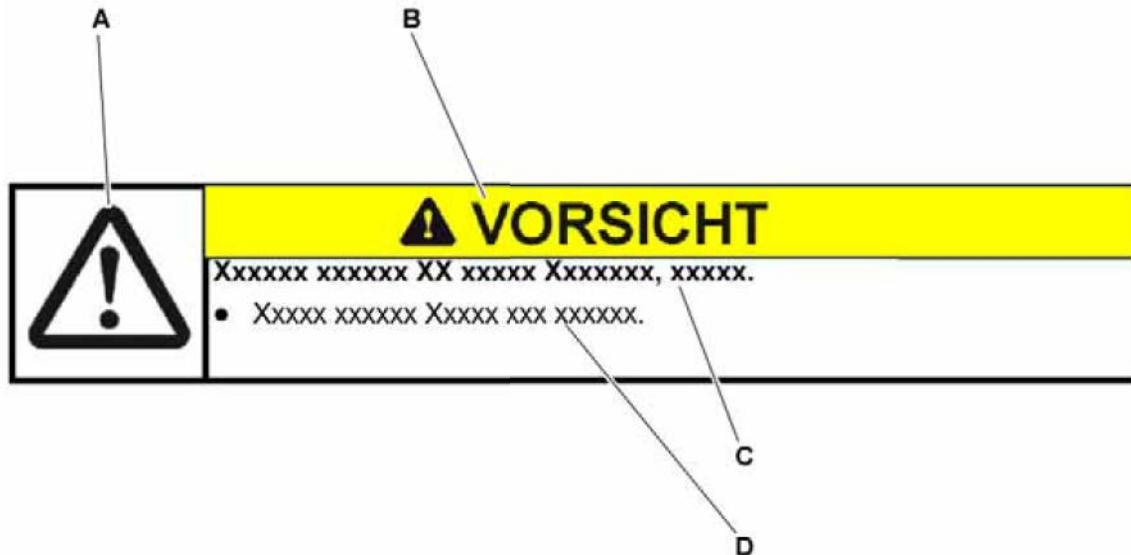
Environment protection



Information

1.3 Design of the safety instructions

The safety instructions of this operating manual are designed according to the following pattern:



A = Safety symbol (see Chapter 1.2 "Safety symbols")

B = Signal word (see Chapter 1.1 "Signal words")

C = Type and consequence of the danger

D = Prevention of the danger

1.4 Information symbols

The following information symbols are used:

- requires you to carry out an action
- ⇒ indicates the results of an action
- ⓘ provides additional information on handling

2 Safety

These instructions, especially the safety instructions and the rules and regulations valid for the operating site, must be observed by all persons working with the gearhead.

In addition to the safety specifications mentioned in this operating manual, the general and also the local regulations on the prevention of accidents (for instance, personal safety equipment) and on environmental protection should be observed.

2.1 EC – Machinery directive

The gearhead is considered a "machine component" and is therefore not subject to the EC Machinery Directive 2006/42/EC.

Operation is prohibited within the area of validity of the EC directive until it has been determined that the machine in which this gearhead is installed corresponds to the regulations within this directive.

2.2 Dangers

The gearhead has been constructed according to current technological standards and accepted safety regulations.

To avoid danger to the operator or damage to the machine, the gearhead may be put to use only for its intended usage (see chapter 2.4 "Intended use") and in a technically flawless and safe state.

- Be informed of the general safety instructions before beginning work. (see Chapter 2.7 "General safety instructions").

2.3 Personnel

Only persons who have read and understood these instructions may carry out work on the gearhead.

2.4 Intended use

The gearhead serves to convert torques and speeds. It is built for industrial applications that do not fall under article 2 of the directive 2002/95/EU (usage restriction of certain dangerous materials on electro and electronic equipment).

The gearhead is specified for installment on motors that:

- correspond to the design B5 (for any divergences, please consult our Customer Service Department [technical customer service])
- show a radial and axial runout tolerance of at least "N" according to DIN 42955 and
- have a smooth shaft

2.5 Reasonably predictable misuse

Any usage that exceeds the maximum permitted speeds, torques and temperature is considered a misuse and is therefore prohibited.

2.6 Guarantee and liability

Guarantee and liability claims are excluded for personal injury and material damage in case of

- Ignoring the information on transport and storage
- Improper use (misuse)
- Improper or neglected maintenance and repair
- Improper assembly / disassembly or improper operation
- Operation of the gearhead when safety devices and equipment are defective
- Operation of the gearhead without lubricant
- Operation of a heavily soiled gearhead
- Modifications or reconstructions that have been carried out without the approval of
WITTENSTEIN alpha GmbH

2.7 General safety instructions

	⚠ WARNING Objects flung out by rotating components can cause serious injuries. <ul style="list-style-type: none">Remove objects and tools from the gearhead before putting it into operation.
	⚠ WARNING Rotating components on the gearhead can pull in parts of the body and cause serious injuries and even death. <ul style="list-style-type: none">Keep a sufficient distance to rotating machinery while the gearhead is running.Secure the machine against restarting and unintentional movements during assembly maintenance work.
	⚠ CAUTION Hot gearhead housing can cause serious burns. <ul style="list-style-type: none">Touch the gearhead housing only when wearing protective gloves or after the gearhead has been at standstill for some time.
	NOTICE Loose or overloaded screw connections can damage the gearhead. <ul style="list-style-type: none">Use a calibrated torque wrench to tighten and check all screw connections for which a tightening torque has been specified.
	Solvents and lubricants can pollute soil and water. <ul style="list-style-type: none">Use and dispose of cleaning solvents as well as lubricants appropriately.

3 Description of the gearbox

The gearbox is a single- or multistage, low-backlash planetary gearbox, which is manufactured as standard in the "M" version (motor installation). The output shaft bearing is designed to withstand high tilting moments and axial forces.

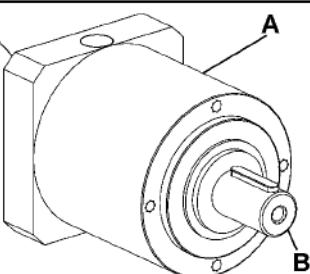
The motor is centered using the clamping hub and not with the adapter plate. A radial distortion of the motor is avoided.

Adaptation to various motors is done by an adapter plate and a bushing.

The optional LPB⁺ has an output flange instead of an output shaft. You thus have the option of mounting a toothed belt pulley.

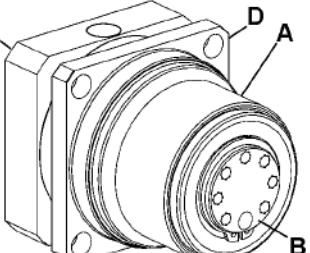
3.1 Overview of the gearbox components

3.1.1 Overview of the gearbox components LP⁺

		Gearhead components LP ⁺
	A	Gearhead housing
	B	Output shaft
	C	Adapter plate

Tbl-1: Overview of the gearbox components

3.1.2 Overview of the gearbox components LPB⁺

		Gearhead components LPB ⁺
	A	Gearhead housing
	B	Output flange
	C	Adapter plate
	D	Mountable flange

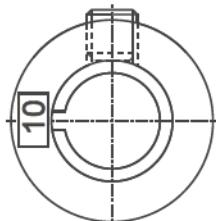
Tbl-2: Overview of the gearbox components

3.2 Type plate

The type plate is attached to the gearbox housing.

		Designation
A	Ordering key (see chapter 3.3 "Ordering key")	
B	Ratio	
C	Serial number	
D	Lubrication information	
E	Production date	

Tbl-3: Type plate (sample values)



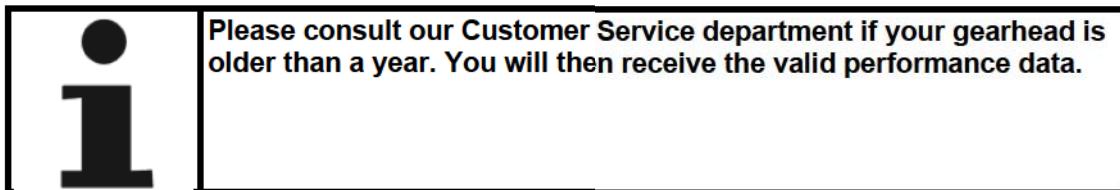
The ratio (e.g. $i = 10$) can also be found on a label on the plug socket. The bushing is properly aligned when the slit points to the label.

3.3 Ordering key

LPB 090-M01-3-111	
Size	Clearance specification 1 = Standard
LP+ 050/070/090/120/155	Bore diameters of the clamping hub 1 = Standard (See catalogue)
LPB+ 070/090/120	Type of output shaft LP+ 0 = Smooth shaft 1 = Feather key DIN6885 type A
Gearhead versions	Type of output shaft LPB+ 1 = centering on output side 3 = centering on motor side
M = Motor-mounted gearhead	Ratio i
Gearhead type	
O = Standard design	
Stage number	
1 = 1-stage	
2 = 2-stage (only LP+)	

3.4 Performance statistics

Please refer to our catalogue or our Internet page for the maximum permitted speeds and torques:<http://www.wittenstein-alpha.de>



3.5 Weight

The table "Tbl-4" specifies the gearhead dimensions with medium-sized adapter plate. If another adapter plate is mounted, the actual dimensions can deviate by up to 20%.

Gearhead size LP ⁺	050	070	090	120	155
1-stage [kg]	0.75	2.0	4.0	8.6	17.0
2-stage [kg]	0.95	2.4	5.0	11.0	21.0
Gearhead size LPB ⁺	050	070	090	120	155
1-stage [kg]	—	1.6	3.3	7.3	—

Tbl-4: Weight

4 Transport and storage

4.1 Scope of delivery

- Check the completeness of the delivery against the delivery note.
① Missing parts or damage must be notified immediately in writing to the carrier, the insurance, or WITTENSTEIN alpha GmbH.

4.2 Packaging

The gearhead is delivered packed in foil and cardboard boxes.

- Dispose of the packaging materials at recycling sites intended for that. Observe the locally valid regulations for disposals.

4.3 Transport

	NOTICE Hard knocks, for instance because of falling or hard dropping, can damage the gearhead. <ul style="list-style-type: none">● Only use hoisting equipment and transports with sufficient capacity.● The maximum permitted lift capacity of a hoist may not be exceeded.● Lower the gearhead slowly.
	WARNING Suspended loads can fall and can cause serious injuries and even death. <ul style="list-style-type: none">● Do not stand under suspended loads.

No special transport mode is prescribed for transporting the gearhead.

Specifications on the weights, refer to Chapter 3.5 "Weight".

4.4 Storage

Store the gearhead in horizontal position and dry surroundings at a temperature of 0 °C to +40 °C in the original packaging. Store the gearhead for a maximum of 2 years.

For storage logistics, we recommend the "first in – first out" method.

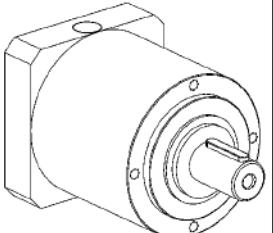
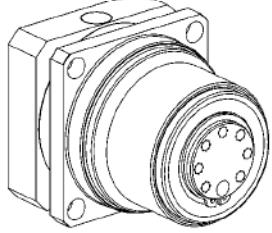
5 Assembly

- Be informed of the general safety instructions before beginning work. (see Chapter 2.7 "General safety instructions").

5.1 Preparations

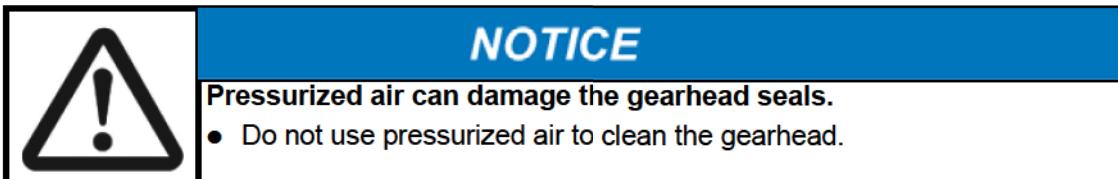
The differences in the assembly sequence of LP⁺ and LPB⁺ are listed in the table "Tbl-5".

- ① If you have any questions, please contact our Customer Service department.

LP ⁺		LPB ⁺	
	—	1 5.2 "Mounting the gearhead to a machine (LPB ⁺)"	
	1 5.3 "Mounting the motor onto the gearhead (LP ⁺ / LPB ⁺)"	2 5.3 "Mounting the motor onto the gearhead (LP ⁺ / LPB ⁺)"	
	2 5.4 "Mounted components on the gear output side"	3 5.4 "Mounted components on the gear output side"	
	3 5.5 "Mounting the gearhead to a machine (LP ⁺)"	—	

Tbl-5: Assembly sequence

The bolts for mounting are not included in the delivery and need to be provided by the customer. Information can be found in the individual assembly steps.



- Clean/de-grease the following components with a clean and lint-free cloth and grease-dissolving, non-aggressive detergent:
 - All fitting surfaces to neighboring components
 - Centering
 - The motor shaft
 - The inner diameter of the plug receptacle
 - The bushing inside and out
- Check the fitting surfaces additionally for damage and impurities.

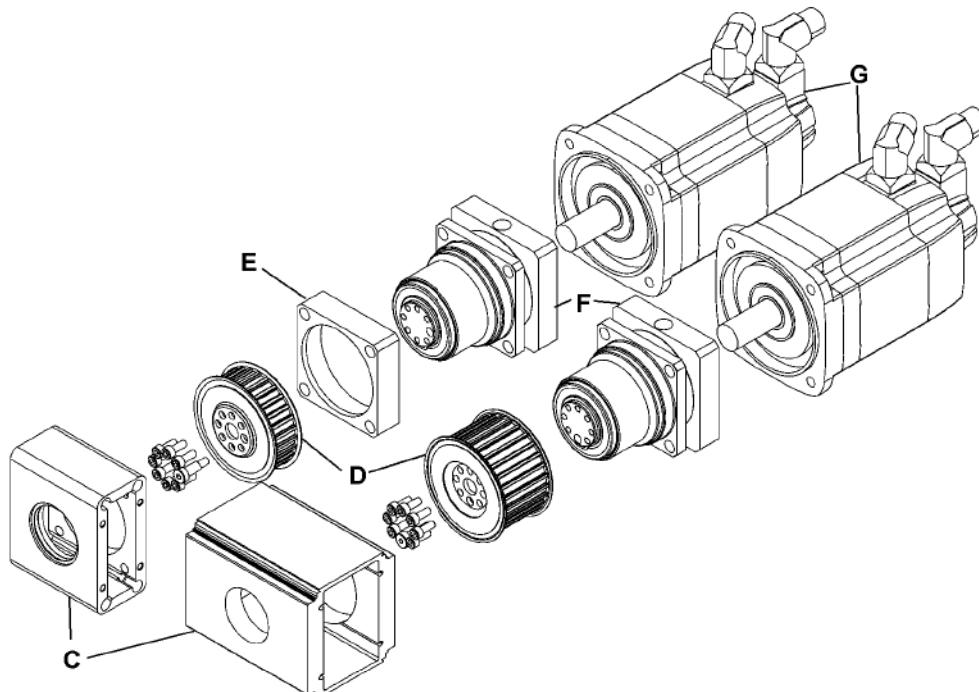
5.2 Mounting the gearhead to a machine (LPB⁺)

	<ul style="list-style-type: none"> • Observe the safety and processing instructions of the cleaning agents and screw-bonding agents to be used.
--	--

There are two centering mechanisms for assembling the gearhead to the machine:

		centering
A	motor side	
B	gear output side	

Tbl-6: Centering mechanisms



- ① If necessary, a spacer (E) may need to be placed between the gear reducer and your machine to position the gear reducer precisely. Such a spacer is **not** part of the drive's delivery and needs to be provided by the customer.
- Thoroughly clean the output flange, centering, fitting surface, spacer and toothed belt pulley. The anti-corrosion agent on the toothed belt pulley must be removed.
 - ① To remove the Aceton or Loctite 7063 anti-corrosion agent, use a clean, lint-free cloth.
- Also clean the browned toothed belt pulley with a brush and remove any salt residue between the flanged wheel and toothed belt wheel.

The fastening screws need to be provided by the customer.

- ① You can find the prescribed screw sizes and tightening torques in Chapter 9.2 "Specifications on mounting onto a machine", table "Tbl-17".
- ① When using hollow profiles (C): Position the toothed belt pulley (D) in the hollow profile before you attach the gearhead.
- Smear screw-bonding agent (for example Loctite 243) onto the fastening bolts.
- Fasten the gearhead to the machine with the fastening screws through the through-holes.
- ① Mount the gearhead in such a way that the type plate remains legible, if possible.
- ① Do not use washers (e.g. plain washers, tooth lock washers).

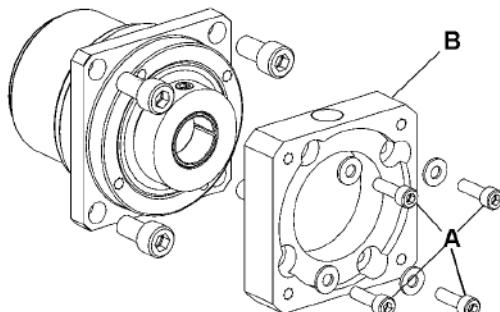
5.3 Mounting the motor onto the gearhead (LP⁺ / LPB⁺)

The standard delivery of a gearhead does not have a motor. The motor to be mounted has to:

- correspond to the B5 design
- have a radial and axial runout tolerance of "N" according to DIN 42955 and
- if possible, have a smooth shaft.
- ① If a motor is included in the delivery, then it is:
 - already firmly mounted on the LP⁺ (no assembly necessary).
 - only mounted hand-tight on the LPB⁺ (assembly necessary).

5.3.1 Pre-mounting adapter plate (only LPB⁺)

The following information is valid for only the LPB⁺. On the LP⁺, the adapter plate is already mounted.



The adapter plate (B) along with the four fastening bolts (A) are included in the scope of delivery.

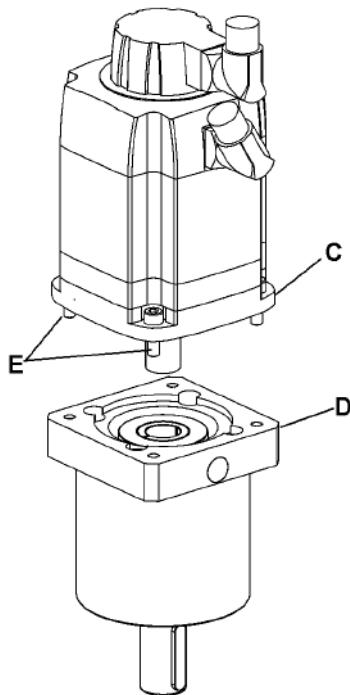
- Place the adapter plate onto the housing and hand-tighten the bolts at first.
- Tighten the bolts in diagonal order in at least two passes to the required tightening torque. See table "Tbl-7"

Gearhead size LPB ⁺	Size	Tightening torque [Nm]
070	M4	2,64
090	M6	8,99
120	M6	8,99

Tbl-7: Fastening bolts adapter plate

5.3.2 Mounting the motor (LP⁺ / LPB⁺)

- Observe the general information and safety instructions of the motor manufacturer.
- Observe the safety and processing instructions of the screw-bonding agents to be used.



- Ensure that the motor is mounted if possible in a vertical direction.
- If the motor shaft has a shaft key, remove the shaft key.
 - ① If recommended by the motor manufacturer, insert a half wedge.
- Turn the plug socket (A) so that the threaded pin (B) can be reached through the mounting holes.
- Push the motor shaft into the plug receptacle of the gearhead.
 - ① The maximum permitted axial forces may not be exceeded, see Chapter 9.1 "Specifications on mounting onto a motor", table "Tbl-15". The motor shaft should slip in easily. If this is not the case, the threaded pin needs to be loosened more.
 - ① The slit of the bushing has to line up with the groove (if existing) of the motor shaft and be turned by 90° to the threaded pin, see table "Tbl-8".
 - ① No gap is permitted between motor (C) and the adapter plate (D).

		Designation
	A B F G H	Plug receptacle Threaded pin Bushing Smooth shaft Keyed shaft

Tbl-8: Arrangement of motor shaft, plug receptacle and bushing

- Smear screw-bonding agent (for example Loctite 243) onto the four bolts (E).
- Fasten the motor (C) onto the adapter plate (D) with the four screws (E).
- Tighten the threaded pin (B) of the plug receptacle (A).
 - ① For bolt sizes and specified torques refer to chapter 9.1 "Specifications on mounting onto a motor", tables "Tbl-15".
- Press the enclosed stopper plugs up to their stop in the mounting bores of the adapter plate (D).

5.4 Mounted components on the gear output side

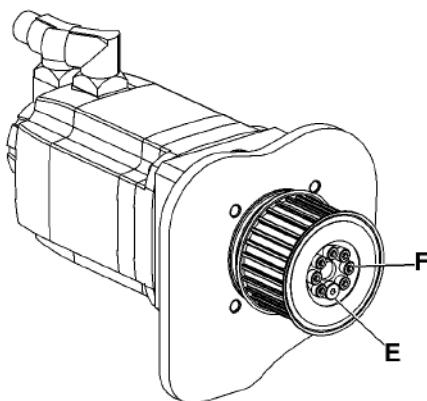
		NOTICE				
		Distortions during mounting operations can damage the gearhead. <ul style="list-style-type: none"> • Mount gearwheels and toothed belt pulleys onto the output shaft without forcing. • Do not on any account attempt an assembly by force or hammering! • Only use suitable tools and equipment for assembly. • If you pull on or shrink-fit a gear wheel onto the output shaft, you must make sure that the maximum permitted static axial forces of the output bearing (see table "Tbl-9") are not exceeded. 				
Size LP⁺ / LPB⁺		050	070	090	120	155

F_a max[N]	1800	4300	5100	11300	18500
-----------------------------	------	------	------	-------	-------

Tbl-9: Maximum permitted static axial forces at static bearing statistic (s_0) = 1.8 and radial force (F_r) = 0

5.4.1 Mountings on the output flange (LPB⁺)

- Observe the safety and processing instructions of the cleaning agents and screw-bonding agents to be used.



Only the version LPB⁺ features an output flange on which a toothed belt pulley can be mounted with the bolts.

- Thoroughly clean the output flange, centering, fitting surface and toothed belt pulley. The anti-corrosion agent on the toothed belt pulley must be removed.
 - ① To remove the Aceton or Loctite 7063 anti-corrosion agent, use a clean, lint-free cloth.
- Also clean the browned toothed belt pulley with a brush and remove any salt residue between the flanged wheel and toothed belt wheel.
- Place the toothed belt pulley onto the output flange.
- Brush the screws with a screw-bonding agent (such as Loctite 243) and tighten the screws by hand initially.
- Tighten the fastening bolts (F) and the close-tolerance bolt (E) (1 piece) in diagonal order making at least two passes to the required tightening torque (see table "Tbl-10").

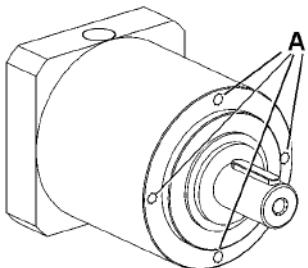
Gearhead size LPB ⁺	Close-tolerance bolt		Fastening bolts	
	Thread x depth [mm] x [mm]	Tightening torque [Nm] (Property class 10.9)	Quantity x Thread x Depth [] x [mm] x [mm]	Tightening torque [Nm] (Property class 12.9)
070	M5 x 12	7,69	5 x M5 x 12	9
090	M6 x 16	13,2	7 x M6 x 16	15,4
120	M6 x 16	13,2	7 x M8 x 20	37,3

Tbl-10: Fastening the toothed belt pulley

The tension of the tooth belt is brought about by its construction. The toothed belt's prestressing force influences the ball bearing life of the gearhead.

- You can determine the theoretical bearing life for each case using our analysis software **cymex®**.
- Set your toothed belt so that there are no lateral starting loads pressing on the toothed belt pulley.

5.5 Mounting the gearhead to a machine (LP⁺)



Four threaded bores are available in the gear unit housing for bolting it to your machine.

- Thoroughly clean the output shaft, centering, and fitting surface.
- The bolts need to be provided by the customer. You can find the prescribed screw sizes and tightening torques in Chapter 9.2 "Specifications on mounting onto a machine", table "Tbl-16".
- Smear screw-bonding agent (for example Loctite 243) onto the four bolts.
 - Fasten the gearhead on the machine with the fastening bolt through the holes.
 - ① Mount the gearhead in such a way that the type plate remains legible.
 - ② Do not use washers (e.g. plain washers, tooth lock washers).

6 Startup and operation

- Be informed of the general safety instructions before beginning work. (see Chapter 2.7 "General safety instructions").

	<p>Improper use can cause damage to the gearhead.</p> <ul style="list-style-type: none">● Make sure that<ul style="list-style-type: none">- the ambient temperature does not drop below –15 °C or exceed +40 °C and- the operating temperature does not exceed +90 °C.● Avoid icing, which can damage the seals.● For other conditions of use, please consult our Customer Service Department.● Only use the gearhead only up to its maximum limit values, see Chapter 3.4 "Performance statistics".● Only use the gearhead only in a clean, dust-free and dry environment.
--	---

7 Maintenance and disposal

- Be informed of the general safety instructions before beginning work. (see Chapter 2.7 "General safety instructions").

7.1 Maintenance work

7.1.1 Visual inspection

- Check the entire gearhead for exterior damage.
- The radial shaft seals are subject to wear. Therefore also check the gearhead for leakage during each visual inspection.
 - ① You can find more general information on radial shaft seals on our partner's Internet site at <http://www.simrit.de>.
 - ① Check the mounting position, so that no foreign medium (e.g. oil) has collected on the output shaft.

7.1.2 Checking the tightening torques

- Check the tightening torque of the fastening bolts on the gearhead housing. For LPB⁺ gearheads, also check the fastening bolts on the toothed belt pulley.
 - ① You can find the prescribed tightening torques in Chapter 9.2 "Specifications on mounting onto a machine", tables "Tbl-16" and "Tbl-17" as well as in Chapter 5.4.1 "Mountings on the output flange (LPB⁺)", table "Tbl-10".
- Check the tightening torque of the threaded pin on the motor mounting.
 - ① You can find the prescribed tightening torques in chapter 9.1 "Specifications on mounting onto a motor", table "Tbl-15".

7.2 Startup after maintenance work

- Clean the outside of the gearhead.
- Attach all safety devices.
- Do a trial run before releasing the gearhead again for operation.

7.3 Maintenance schedule

Maintenance work	At startup	First time after 500 operating hours or 3 months	Every 3 months	Yearly
Visual inspection	X	X	X	
Checking the tightening torques	X	X		X

Tbl-11: Maintenance schedule

7.4 Notes on the lubricant used

	All gearheads are lubricated for their service life by the manufacturer with a mineral oil-based lithium soap grease or with a food-safe synthetic grease (carbon hydride oil, aluminum complex soap) (see type plate). All bearings are permanently lubricated by the company.
---	---

You can receive further information on the lubricants directly from the manufacturer:

Standard lubricants	Lubricants for the food industry (USDA-H1 registered)
Castrol Industrie GmbH, Mönchengladbach Tel.: + 49 2161 909-30 www.castrol.com	Klüber Lubrication München KG, Munich Tel.: + 49 89 7876-0 www.klueber.com

Tbl-12: Lubricant manufacturers

7.5 Disposal

Consult our Customer Service Department for supplementary information on exchanging the adapter plate, on disassembly, and on disposal of the gearhead.

- Dispose of the gearhead at the recycling sites intended for this purpose.
① Observe the locally valid regulations for disposals.

8 Malfunctions

	NOTICE Changed operational behavior can be an indication of existing damage to the gearhead or cause damage to the gearhead. <ul style="list-style-type: none"> Do not put the gearhead back into operation until the cause of the malfunction has been rectified. 	
	Rectifying of malfunctions may be done by only by especially trained technicians.	
Fault	Possible cause	Solution
Increased operating temperature	The gearhead is not suited for the task.	Check the technical specifications.
	Motor is heating the gearhead.	Check the wiring of the motor. Ensure adequate cooling. Change the motor.
	Ambient temperature too high.	Ensure adequate cooling.
Increased noises during operation	Distortion in motor mounting	Please consult our Customer Service Department.
	Damaged bearings	
	Damaged gear teeth	
Loss of lubricant	Lubricant quantity too high	Wipe off discharged lubricant and continue to watch the gearhead. Lubricant discharge must stop after a short time.
	Seals not tight	Please consult our Customer Service Department.

Tbl-13: Malfunctions

9 Appendix

9.1 Specifications on mounting onto a motor

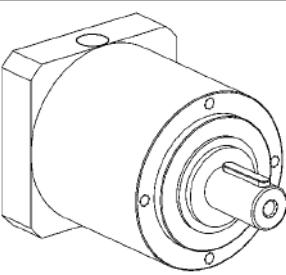
		Designation	
B	A	A	Plug receptacle
G	B	B	Threaded pin
F	F	F	Bushing
G	G	G	Smooth shaft
H	H	H	Keyed shaft

Tbl-14: Arrangement of motor shaft, plug receptacle and bushing

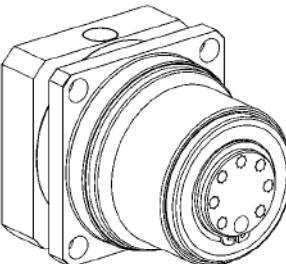
Gearhead size LP ⁺ / LPB ⁺	Clamping hub interior Ø [mm]	Width across flats, threaded pin (B) [mm]	Tightening torque [Nm]	Max. axial force [N]
050	11	3	5.6	45
070	16	4	14	80
090	24	5	23	100
120	32	6	45	150
155, 1-stage	42	8	78	180
155, 2-stage	32	6	45	150

Tbl-15: Specifications on mounting onto a motor

9.2 Specifications on mounting onto a machine

	Size LP ⁺	Bore Ø [mm]	Bolt size / property class	Tightening torque [Nm]
	050	44	M4 / 12.9	4.55
	070	62	M5 / 12.9	9.0
	090	80	M6 / 12.9	15.4
	120	108	M8 / 12.9	37.3
	155	140	M10 / 12.9	73.4

Tbl-16: Threaded bores in the gearhead housing LP⁺

		Gearhead size LPB ⁺	Bore Ø [mm]	Bolt size / property class	Tightening torque [Nm]
	070	82	M8 / 12.9	37.3	
	090	106	M10 / 12.9	73.4	
	120	144	M12 / 12.9	126	

Tbl-17: Through-holes in gearhead housing LPB⁺

9.3 Tightening torques for common thread sizes in general mechanics

The specified tightening torques for headless screws and nuts are calculated values and are based on the following conditions:

- Calculation acc. VDI 2230 (Issue February 2003)
- Friction value for thread and contact surfaces $\mu=0.10$
- Exploitation of the yield stress 90 %

Property class Bolt / nut	Tightening torque [Nm] for threads												
	M3	M4	M5	M6	M8	M10	M12	M14	M16	M18	M20	M22	M24
8.8 / 8	1.15	2.64	5.24	8.99	21.7	42.7	73.5	118	180	258	363	493	625
10.9 / 10	1.68	3.88	7.69	13.2	31.9	62.7	108	173	265	368	516	702	890
12.9 / 12	1.97	4.55	9.00	15.4	37.3	73.4	126	203	310	431	604	821	1042

Tbl-18: Tightening torques for headless screws and nuts

MP-Series™ Low-Inertia Motors



Allen-Bradley

Brushless servo motors with absolute feedback

The Allen-Bradley® MP-Series Low-Inertia, high-output brushless servo motors use innovative design characteristics to reduce motor size while delivering significantly higher torque. These compact and highly dynamic brushless servo motors from Rockwell Automation are designed to meet the demanding requirements of high-performance motion systems. This series of servo motors is typically used with the Allen-Bradley Kinetix® 6000, Kinetix 6200, Kinetix 6500, Kinetix 300, and Kinetix 350 servo drive families. Available in nine frame sizes, these motors provide continuous stall torque from 0.26 to 163 Nm (2.3-1440 lb-in.) and peak torque from 0.77 to 278 Nm (6.8-2460 lb-in.).

MP-Series Low-Inertia Motors Provide:

- Innovative winding technology yields up to 40% higher torque per unit size than conventional servo motors
- Improved winding insulation material for enhanced thermal management and heat transfer, resulting in higher performance
- High-energy rare-earth magnets for quicker acceleration
- New SpeedTEC DIN connectors allow flexible orientation of connectors and use of a single cable family with all MP-Series motors
- Integral 24-volt brake option
- Broad torque range – all within one motor family
- Optional Shaft Seal for IP 66 environmental rating
- Standard IEC 72-1 mounting dimensions
- Operating temperature range: 0 - 40° C (32 - 104° F)
- The MP-Series Low-Inertia Motors are UL recognized components to applicable UL and CSA standards and CE marked for all applicable directives.



Applications where more power is required in a smaller package will benefit from the use of MP-Series Low Inertia Motors. Typical applications include: packaging, converting, electronics assembly, automotive, metal forming and material handling.

High-Performance Feedback

MP-Series Low-Inertia motors are available with high performance encoders with a choice of single-turn or multi-turn high-resolution feedback.

- Up to 2 million counts per revolution for smooth performance and precise control (MPL-A/B3xx, -A/B4xx, -A/B45xx, -A/B5xx, -B6xx, -B8xx, and -B9xx motors)
- Up to 260 thousand counts per revolution for smooth performance and precise control (MPL-A/B15xx and -A/B2xx motors)
- Multi-turn encoder provides high-resolution absolute position feedback within 4096 turns. The electromechanical design does not require a battery
- MP-Series servo motors with high resolution encoders may be used as a component of the Kinetix safe-off feature

Smart Motor Technology

- On-board memory retains motor identity
- Communication link automatically reports identity to the system upon startup for reduced commissioning time

LISTEN.
THINK.
SOLVE.



Allen-Bradley • Rockwell Software

**Rockwell
Automation**

230 Volt Motor Specifications

Catalog Number	Rated Speed rpm	Rated Output kW	Rotor Inertia* kg-m ² (lb-in.-s ²)	Continuous Stall Torque Nm (lb-in.)	Peak Stall Torque Nm (lb-in.)	Continuous Stall Current Amperes (0-peak)	Peak Stall Current Amperes (0-peak)
MPL-A1510V	8000	0.16	0.000074 (0.000065)	0.26 (2.3)	0.77 (6.8)	1.1	3.4
MPL-A1520U	7000	0.27	0.000013 (0.00012)	0.49 (4.3)	1.58 (14)	1.8	6.1
MPL-A1530U	7000	0.39	0.000023 (0.000020)	0.90 (8.0)	2.82 (25)	2.8	10.1
MPL-A210V	8000	0.37	0.000015 (0.00013)	0.55 (4.9)	1.52 (14)	3.1	10.2
MPL-A220T	6000	0.62	0.000039 (0.00035)	1.61 (14)	4.74 (42)	4.5	15.5
MPL-A230P	5000	0.86	0.000063 (0.00056)	2.10 (19)	8.20 (73)	5.4	23.0
MPL-A310P	5000	0.73	0.000044 (0.00039)	1.58 (14)	3.61 (32)	4.9	14.0
MPL-A310F	3000	0.46	0.000044 (0.00039)	1.58 (14)	3.61 (32)	3.2	9.3
MPL-A320P	5000	1.3	0.000078 (0.00069)	3.05 (27)	7.91 (70)	9.0	29.5
MPL-A320H	3500	1.0	0.000078 (0.00069)	3.05 (27)	7.91 (70)	6.1	19.3
MPL-A330P	5000	1.8	0.00012 (0.0010)	4.18 (37)	11.1 (98)	12.0	38.0
MPL-A420P	5000	2.0	0.00026 (0.0023)	4.74 (42)	10.2 (90)	12.7	46.0
MPL-A430P	5000	2.2	0.00038 (0.0033)	5.99 (53)	19.8 (175)	16.8	67.0
MPL-A430H	3500	1.8	0.00038 (0.0033)	6.21 (55)	19.8 (175)	12.2	45.0
MPL-A4530F	2800	1.9	0.00040 (0.0036)	8.36 (74)	20.3 (180)	13.4	42.0
MPL-A4530K	4000	2.5	0.00040 (0.0036)	8.13 (72)	20.3 (180)	19.5	62.0
MPL-A4540C	1500	1.5	0.00052 (0.0046)	10.2 (90)	27.1 (240)	9.4	29.0
MPL-A4540F	3000	2.6	0.00052 (0.0046)	10.2 (90)	27.1 (240)	18.4	58.0
MPL-A4560F	3000	3.0	0.00078 (0.0067)	14.1 (125)	34.4 (305)	22.0	66.0
MPL-A520K	4000	3.5	0.000783 (0.0069)	10.7 (95)	24.3 (215)	23.0	65.0
MPL-A540K	4000	5.5	0.00147 (0.013)	19.4 (172)	48.6 (430)	41.5	120.0
MPL-A560F	3000	5.3	0.00213 (0.019)	26.8 (237)	61.0 (540)	42.0	120.0

*Rotor inertia values shown are for non-brake encoder motors. Inertias are higher for brake and resolver versions of the motors. The incremental encoder and resolver versions are available in limited sizes.

In addition to the MP-Series Low Inertia servo motors, Rockwell Automation offers a variety of other Allen-Bradley MP-Series motors, enabling you to use exactly the right motor for your application.

Motor	Description	Features	Applications
	MP-Series Food Grade Motors combine the characteristics of the MP-Series Low-Inertia Motors with features specifically designed to meet the unique needs of many food and beverage packaging and handling applications. These motors address the challenges of food environments by incorporating improved sealing techniques and non-corrosive food grade fasteners and coatings.	<ul style="list-style-type: none"> Can be used in close proximity to food IP66 and IP67 for low pressure wash and incidental spillage protection Dilute cleaning compounds can be used Durable two-part food-grade epoxy Food-grade grease All stainless steel fasteners and shaft High-resolution feedback standard Speeds up to 5000 rpm 	<ul style="list-style-type: none"> Food packaging Volumetric filling Form, fill, seal Food handling <i>For meat, poultry, dairy, and applications, the MP-Series Stainless Steel motors are recommended</i>
	MP-Series Stainless Steel Motors are specifically designed to meet the unique needs of hygienic environments. Use these servo motors even in high pressure, highly caustic washdown conditions, such as meat and poultry and dairy applications.	<ul style="list-style-type: none"> Can be used in close proximity to food IP66, IP67 and IP69K for 1200 psi caustic washdown Smooth, passivated 300 series stainless steel cylindrical exterior Factory sealed and leak tested High-resolution feedback standard 	<ul style="list-style-type: none"> Meat, poultry and dairy Food slicing and filling Raw food handling Processing Closing machinery Life science Consumer products

460 Volt Motor Specifications

Catalog Number	Rated Speed rpm	Rated Output kW	Rotor Inertia* kg·m ² (lb-in.-s ²)	Continuous Stall Torque Nm (lb-in.)	Peak Stall Torque Nm (lb-in.)	Continuous Stall Current Amperes (0-peak)	Peak Stall Current Amperes (0-peak)
MPL-B1510V	8000	0.16	0.0000074 (0.000065)	0.26 (2.3)	0.77 (6.8)	.95	3.1
MPL-B1520U	7000	0.27	0.000013 (0.00012)	0.49 (4.3)	1.58 (14)	1.8	6.1
MPL-B1530U	7000	0.39	0.000023 (0.00020)	0.90 (8.0)	2.82 (25)	2.0	7.2
MPL-B210V	8000	0.37	0.000015 (0.00013)	0.55 (4.9)	1.52 (13)	1.8	5.8
MPL-B220T	6000	0.62	0.000039 (0.00035)	1.61 (14)	4.74 (42)	3.3	11.3
MPL-B230P	5000	0.86	0.000063 (0.00056)	2.10 (19)	8.20 (73)	2.6	11.3
MPL-B310P	5000	0.77	0.000044 (0.00039)	1.58 (14)	3.61 (32)	2.4	7.1
MPL-B320P	5000	1.5	0.000078 (0.00069)	3.05 (27)	7.91 (70)	4.5	14.0
MPL-B330P	5000	1.8	0.00012 (0.0010)	4.18 (37)	11.1 (98)	6.1	19.0
MPL-B420P	5000	1.9	0.00026 (0.0023)	4.74 (42)	13.5 (120)	6.4	22.0
MPL-B430P	5000	2.2	0.00038 (0.0033)	6.55 (58)	19.8 (175)	9.2	32.0
MPL-B4530F	3000	2.1	0.00040 (0.0036)	8.25 (73)	20.3 (180)	7.0	21.0
MPL-B4530K	4000	2.6	0.00040 (0.0036)	8.25 (73)	20.3 (180)	11.0	31.0
MPL-B4540F	3000	2.6	0.00052 (0.0046)	10.2 (90)	27.1 (240)	9.1	29.0
MPL-B4560F	3000	3.2	0.00078 (0.0067)	14.1 (125)	34.4 (305)	11.8	36.0
MPL-B520K	4000	3.5	0.000783 (0.0069)	10.7 (95)	23.2 (205)	11.5	33.0
MPL-B540D	2000	3.4	0.00147 (0.013)	19.4 (172)	41.0 (362)	10.5	23.0
MPL-B540K	4000	5.4	0.00147 (0.013)	19.4 (172)	48.6 (430)	20.5	60.0
MPL-B560F	3000	5.5	0.00213 (0.019)	26.8 (237)	67.8 (600)	20.6	68.0
MPL-B580F	3000	7.1	0.00289 (0.023)	34.0 (301)	87.0 (770)	26.0	94.0
MPL-B580J	3800	7.9	0.00289 (0.023)	34.0 (301)	87.0 (770)	32.0	115.0
MPL-B640F	3000	6.1	0.00400 (0.0354)	36.7 (325)	72.3 (640)	32.1	65.0
MPL-B660F	3000	6.15	0.00580 (0.051)	48.0 (425)	101.1 (895)	38.5	96.0
MPL-B680D	2000	9.3	0.00775 (0.0685)	62.8 (556)	154.2 (1365)	34.0	94.0
MPL-B680F	3000	7.5	0.00775 (0.0685)	60.0 (531)	108.5 (960)	48.0	96.0
MPL-B680H	3500	7.5	0.00775 (0.0685)	60.0 (531)	146.9 (1300)	51.0	140.0
MPL-B860D	2000	12.5	0.0169 (0.150)	83.0 (735)	152.5 (1350)	47.5	95.5
MPL-B880C	1500	12.6	0.0224 (0.198)	110.0 (973)	203.0 (1800)	47.5	97.5
MPL-B880D	2000	12.6	0.0224 (0.198)	110.0 (973)	147.0 (1300)	67.0	96.0
MPL-B960B	1200	12.7	0.0273 (0.242)	130.0 (1150)	231.0 (2050)	42.5	94.0
MPL-B960C	1500	14.8	0.0273 (0.242)	124.3 (1100)	226.0 (2000)	55.0	125.0
MPL-B960D	2000	15.0	0.0273 (0.242)	124.3 (1100)	226.0 (2000)	70.0	125.0
MPL-B980B	1000	15.2	0.0354 (0.313)	162.7 (1440)	278.0 (2460)	40.0	94.0
MPL-B980C	1500	16.8	0.0354 (0.313)	158.2 (1400)	271.0 (2400)	68.0	140.0
MPL-B980D	2000	18.6	0.0354 (0.313)	158.2 (1400)	260.0 (2300)	79.0	140.0
MPL-B980E	2750	13.0	0.0354 (0.313)	141.0 (1250)	237.0 (2100)	105.0	230.0

*Rotor inertia values shown are for non-brake encoder motors. Inertias are higher for brake and resolver versions of the motors. The incremental encoder and resolver versions are available in limited sizes.

Connectors and Cables

New SpeedTEC DIN connector versions of MP-Series Low-Inertia Motors allow flexible orientation of connectors and use of a single cable family with all MP-Series motors.

The SpeedTEC DIN connectors are designed to provide a quick, one-quarter turn connection. This provides an easy, yet secure servo connection.

The connectors meet a wide range of codes and standard requirements:

- UL-Listed
- NFPA 79 compliant
- DESINA cable jacket coloring
- Tray cable rating
- RoHS and REACH
- 600V insulation rating



Motor Cables

Rockwell Automation offers a comprehensive selection of power, feedback, and brake cables for your MP-Series motors. Offerings include standard and continuously flexing cables, in lengths ranging from 1 meter to 90 meters.

The continuously flexing power and brake cables comply with RoHS and NFPA-79 tray ratings, and are composed of UL-listed bulk cable. Jacket coloring is compliant with DESINA specifications.



Cables are available for MP-Series Motors and other Allen-Bradley motors and actuators with DIN style connectors.

Motor Accessories

Shaft seal kits are available for all frame sizes of the MP-Series Low Inertia motors. When installed correctly, the seals yield an IP66 rating at the shaft. Note that shaft seals are wearing parts that will need to be replaced periodically. Refer to the Motion Control Selection Guide to select the shaft seal kit for your specific motor.

Motor-end connector kits are available for most MP-Series motors. They are used by customers who choose to build their own cables. The kits utilize metallic backshells, compression-style sealing to the cable jacket, and are solder-style or crimp-style connector sockets depending on the kit. Crimping tools are offered by Rockwell Automation for crimp-style sockets.

For more information refer to our website: www.ab.com/motion, or the Kinetix selection guide, GMC-SG001x.

Allen-Bradley and Kinetix are registered trademarks of Rockwell Automation. SERCOS interface is a trademark of Interests Group SERCOS interface e.V of Stuttgart, Germany.

www.rockwellautomation.com

Power, Control and Information Solutions Headquarters

Americas: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204-2496 USA, Tel: (1) 414.382.2000, Fax: (1) 414.382.4444

Europe/Middle East/Africa: Rockwell Automation NV, Pegasus Park, De Kleetlaan 12a, 1831 Diegem, Belgium, Tel: (32) 2 663 0600, Fax: (32) 2 663 0640

Asia Pacific: Rockwell Automation, Level 14, Core F, Cyberport 3, 100 Cyberport Road, Hong Kong, Tel: (852) 2887 4788, Fax: (852) 2508 1846



Project: ST3510 Gen 3.0

Date: 04/08/2016 Revision: 01

Subject: Servo/Gear Head/Paletti Clamping Hub/Paletti Coupling Connection

This document identifies key components and outlines proper assembly for the servo, gear head, and Paletti lift actuator.

General Notes:

1) If a jam is incurred, unit has been over traveled, or if slippage has been experienced.

Maintenance must disassemble/remove the motor and gear head from the unit and inspect the motor to gear head and gear head to Paletti connections. Replace any worn or scored items, and clean the shafts. Gear head output shaft must be cleaned up and all aluminum removed from shaft prior to re-assembly. All connections must be torqued to factory specifications listed in manual and this document.

- Unit is designed to have the Aluminum Paletti Clamping Hub which couples the gear head to Paletti unit slip in the event of a jam, crash, over travel condition instead of damaging or destroying a more expensive gear head, servo motor, or Paletti unit.
- Secure a strap to conveyor carriage and tied back to unit frame. This will keep carriage from dropping/free falling when motor/gear head is removed from Paletti unit. May have to raise or lower strap to line up set screws with access holes.

2) Anytime the motor/gear head unit has been taken apart or components replaced remove oil, grease, ... from all metallic parts and shafts prior to assembling components. Use a clean rag and a degreaser (brake cleaner). Spray cleaner on rag and wipe components, do not spray components directly. Re-torque all connections to factory specifications listed in manual and this document.

3) Conveyor Lift Carriage – In the event of a jam or crash inspect the conveyor lift carriage for damage. If carriage has been bent or damaged carriage must be replaced.

- Do not sit, stand, or ride on the carriage, unit was not designed to support weight other than the tote and its load.

4) Reference picture #14 for important installation notes

5) Refer to manufacturers manual for additional instructions and or contact
Paletti USA at (267) 289-0020

Picture #1





Drive train Dis-Assembly and Re-Assembly instructions

If possible move carriage up 25% from lower position to make access to bolt removal easier.

****Lock-Out/Tag-Out Power to unit**

Steps to remove Servo/Gear box assembly from Paletti unit

- Á Remove yellow guard (ref picture #1)
- Á **Attach ratchet strap from frame to carriage to keep carriage from dropping when Servo/Gear box removed**
- Á Dis-connect the cables from the Servo motor
- Á Remove (3) bolts from back side of Paletti (carriage side) using a 5MM hex wrench (ref back side of picture #13)
- Á Remove Servo/Gear box by pulling out back of unit

Steps to Re-Install Servo/Gear box assembly to Paletti unit

(After Expansion Coupling installed into Paletti unit properly)

- Á Hold Servo/Gear box assembly up to Paletti unit, slowly ratchet carriage up as required until the Couplings align/mate with each other and Servo/Gear box assembly engages and mates with Paletti unit (ref picture #13)
- Á Install (3) bolts from the back side of Paletti unit, stagger torque/tighten them. **Do not over tighten bolts**
- Á Re-Connect the cables to Servo motor
- Á Re-Install yellow guard (ref picture #1)
- Á Remove ratchet strap from frame and carriage

Steps to remove Servo Motor from Gear box

- Á Remove Servo motor from Gear box by using a 5MM hex wrench to remove (4) bolts that mount Servo motor to Gear box (ref picture #4,5)
- Á Remove rubber cap from Gear box and rotate Servo motor until set screw aligns with hole (ref picture #4)
- Á Loosen set screw by using a 4MM hex wrench, pull Servo motor from Gear box (ref picture #4)
- Á Remove Alpha Clamp Hub (ref picture #4,5)

Steps to Re-Install Servo Motor to Gear box

- Á Clean Servo Motor shaft with brake cleaner and rag (ref picture #5)
Note: Spray brake cleaner onto rag then wipe
- Á Clean inside of Gear box hub with brake cleaner and rag (ref picture #6)
Note: Spray brake cleaner onto rag then wipe



- À Clean Alpha Clamp Hub inside and outside with brake cleaner and rag (ref picture #4,5)
- À Insert Alpha Clamp Hub into Gear box, align slot in Alpha Clamp Hub with #7 on Gear box (ref picture #6)
- À Rotate Gear box shaft to align the set screw with hole in Gear box (ref picture #6)
- À Insert Servo Motor into Alpha Clamp Hub/Gear box, align the keyway on Servo Motor with the slot in Alpha Clamp Hub and #7 on Gear box (ref picture #6)
- À Hold Servo Motor tight to Gear box and torque the Alpha Clamp Hub set screw by using 4MM hex wrench to 124 in Lbs
Note: May need to cut a 4MM hex key to 1-3/4" lg and insert and tape into a 4MM socket to reach thru Gear box hole to torque the Alpha Clamp Hub set screw
- À Rotate Servo Motor to align mounting bolts with Gear box, tighten with 5MM hex wrench

Steps to remove Aluminum Clamp Hub

- À Remove Servo motor from Gear box by using a 5MM hex wrench to remove (4) bolts that mount Servo motor to Gear box. Remove rubber cap from Gear box and rotate Servo motor until set screw aligns with hole, loosen set screw by using a 4MM hex wrench, pull Servo motor from Gear box. (ref picture #4,5)
- À Rotate Gear box shaft to align hex bolt in Aluminum Clamp Hub with hole in Gear box (ref picture #3)
- À Remove the socket head bolt completely by using a 4MM hex wrench (ref picture #3)
- À Take a straight blade screw driver and tap into the Aluminum Clamp Hub slot just enough to expand Hub to slip off Gear box shaft (ref picture #3)
**Do not over expand Hub
Note: If the screw driver method does not work remove (4) bolts holding the black spacer block to the Gear box by using a 4MM hex wrench then remove the Aluminum Clamp Hub. Re-Install the bolts and torque using stagger torque, torque to 46 in Lbs (ref picture #7)

Steps to Re-Install Aluminum Clamp Hub

- À Confirm there is not aluminum on the Gear box shaft. If aluminum present remove using fine emery cloth
- À Confirm Aluminum Clamp Hub bore is not scored, if scored replace the Hub with a new one
- À Clean the Gear box shaft with brake cleaner and rag
Note: Spray brake cleaner onto rag then wipe
- À Clean the Aluminum Clamp Hub bore with brake cleaner and rag
- À Install Aluminum Clamp Hub into the Gear box shaft (may have to use a straight blade screw driver inserted into slot to expand Hub slightly. **Do not over expand Hub. Align slot in Hub with keyway in Gear box shaft (ref picture #8)
- À Insert Hub into shaft until aligned as shown in picture #8. Counter bore in Aluminum Clamp Hub to be flush with Gear box shaft (ref picture #8)



- Á Rotate Gear box shaft from Servo motor end until Aluminum Clamp Hub bolt lines up with hole in Gear box and insert bolt (ref picture #3)
- Á Torque bolt by using a 4MM hex wrench to 71 in Lbs.
Note: May need to cut a 4MM hex key to 1-3/4" lg and insert and tape into a 4MM socket to reach thru Gear box hole to torque the Aluminum Clamp Hub bolt (ref picture #3)

Steps to remove Paletti Expansion Coupling

- Á Reference picture #13, loosen bolt about 4 turns with 5MM hex wrench
- Á Take 3/4" dia brass punch and strike head of bolt to dis-engage the wedge
- Á Remove bolt and push wedge out back of Paletti unit
- Á Take 3/4" dia brass punch and gently tap the back of Expansion Coupling to push it out the front of Paletti unit

Steps to Re-Install Paletti Expansion Coupling

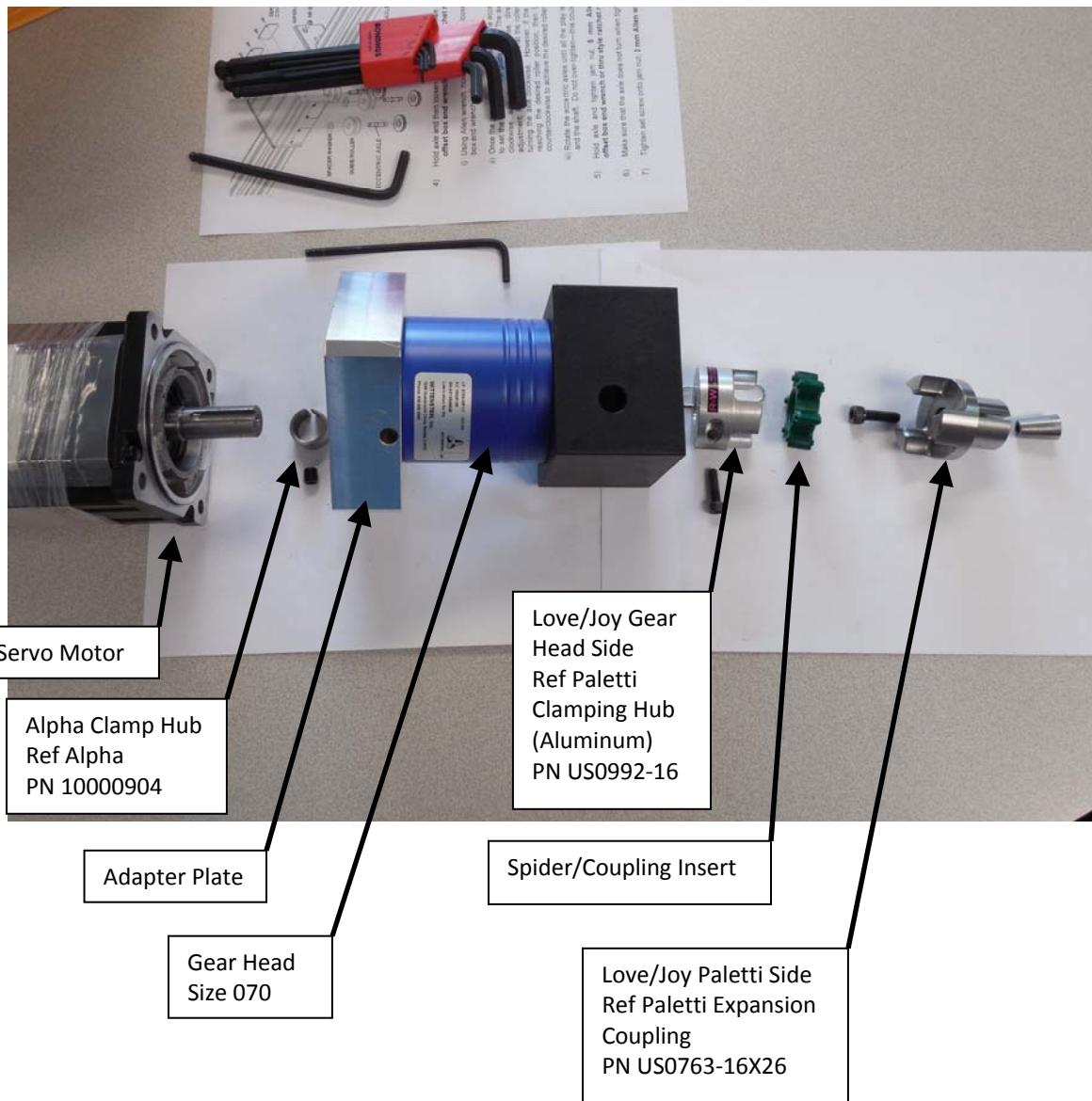
- Á Inspect Expansion Coupling for damage, replace if damaged
- Á Remove all oil from all surfaces using brake cleaner and rag
- Á Insert wedge into the Expansion Coupling and start bolt, don't draw wedge tight leave loose
- Á Insert Expansion Coupling into Paletti unit, place 1MM shims between Expansion Coupling and Paletti unit
Note: 1MM gap very critical
- Á Tighten wedge bolt, torque wedge bolt to 106 in Lbs
- Á Remove 1MM shims from behind Expansion Coupling
- Á Re-Install Spider/Coupling Insert (green plastic piece)

Remove Lock-Out/Tag-Out and restore power to unit

Re-Home and test unit

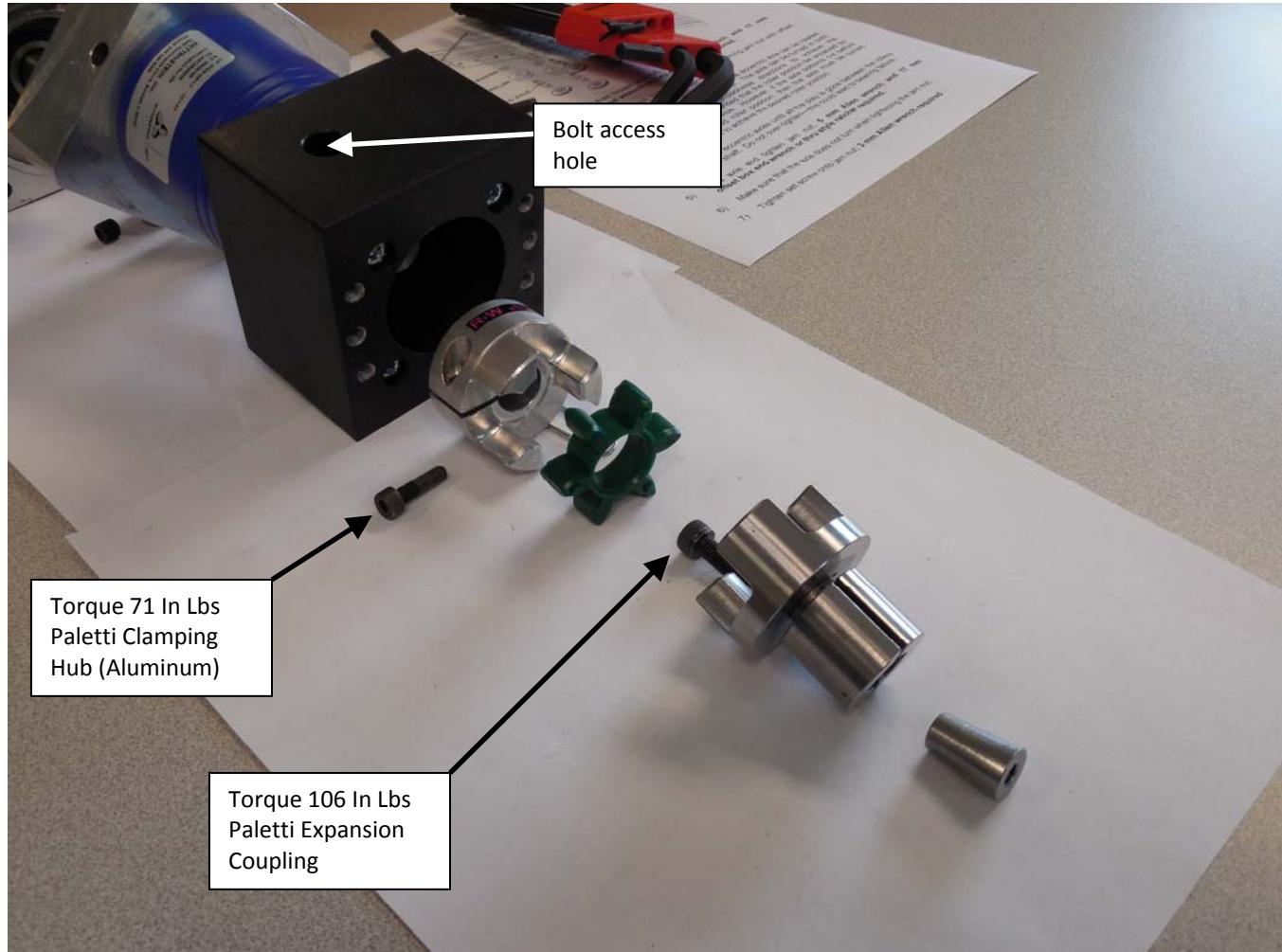
Servo/Gear Head/Coupling Assembly – Part Identification

Picture #2



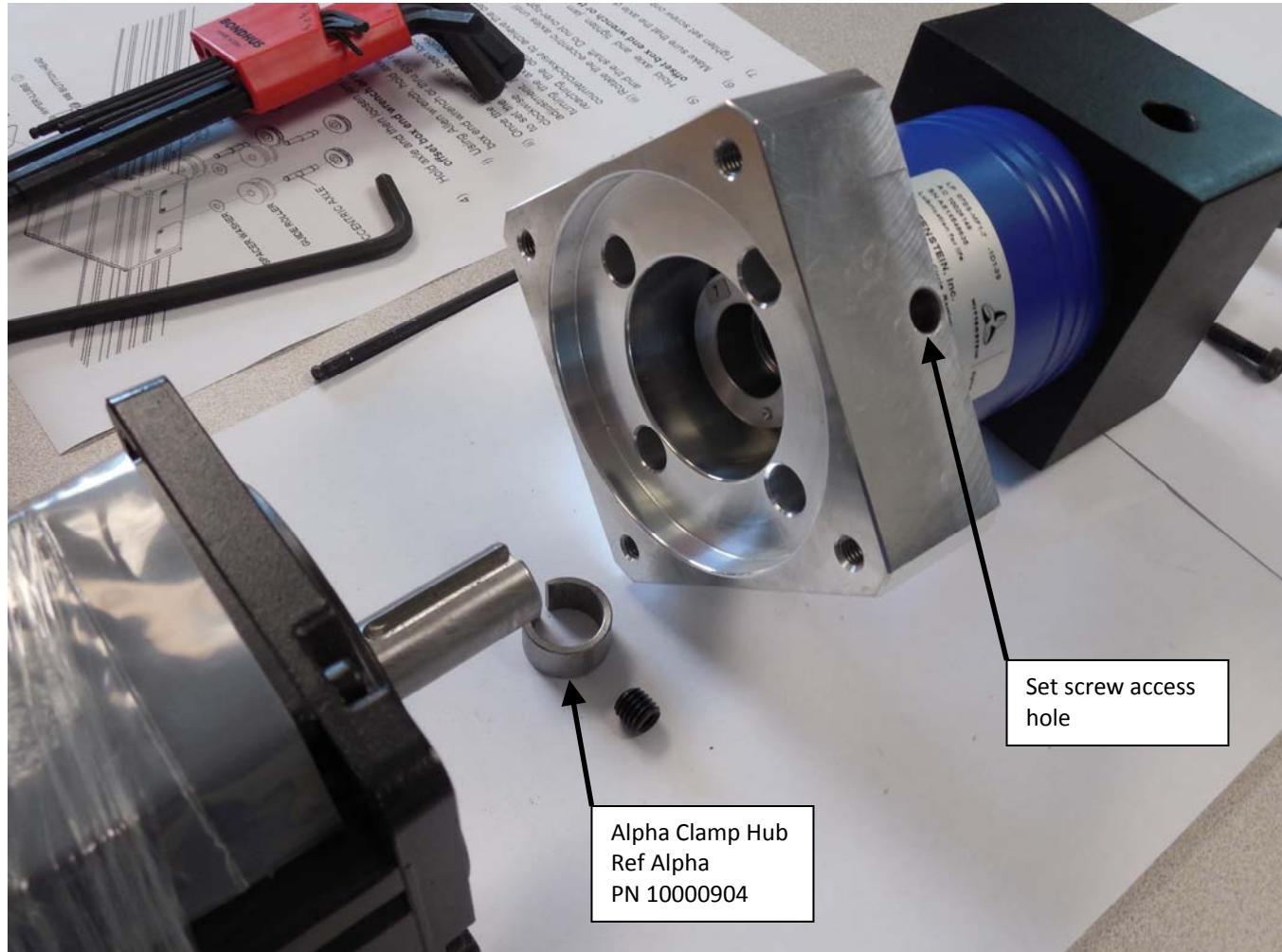
Paletti Clamp Coupling, Expansion Coupling at Gear Head – Part Identification

Picture #3



Servo/Gear Head, Alpha Clamp Hub

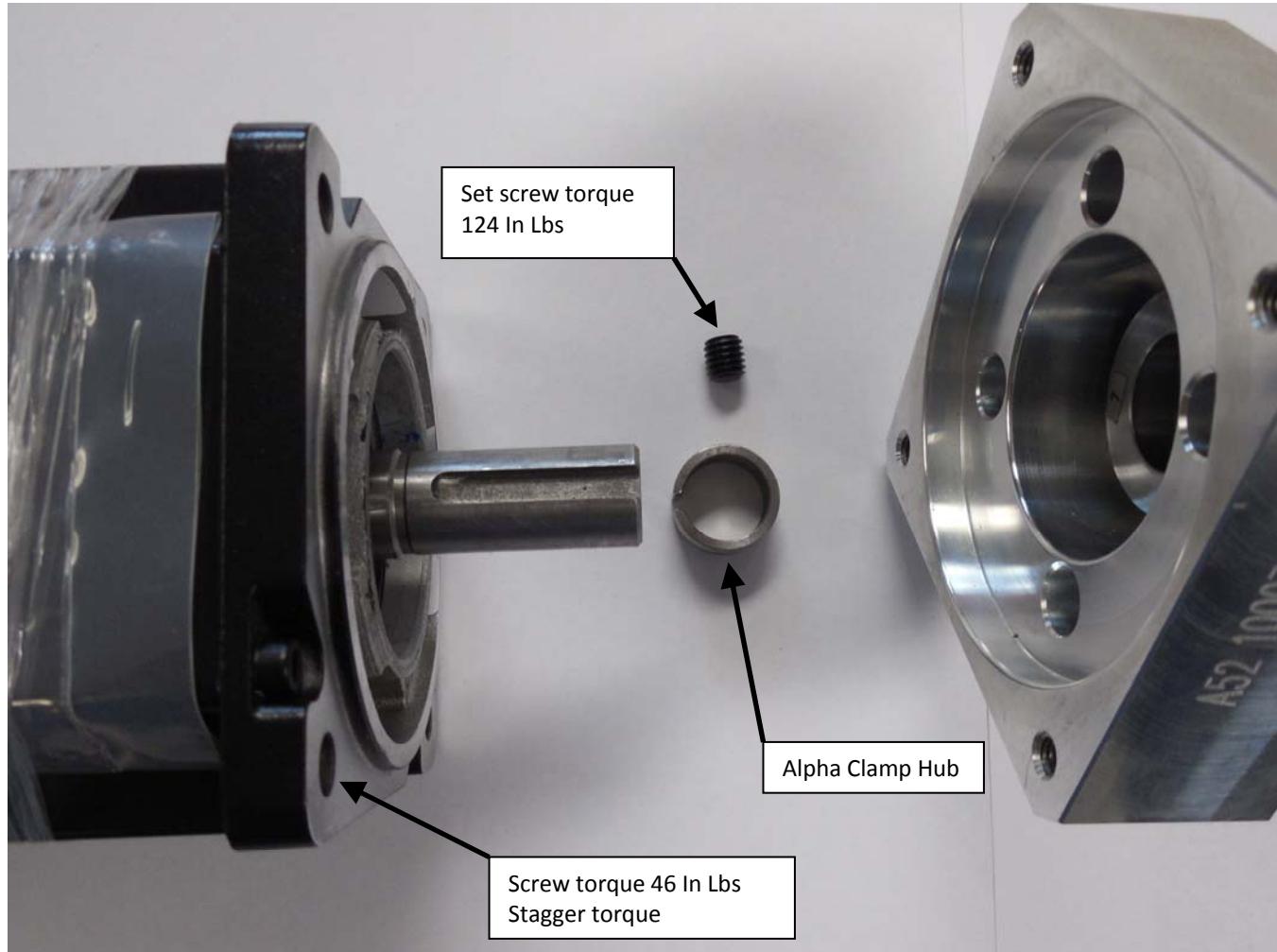
Picture #4



Carefully remove the rubber cap to access the set screw. Re-install cap after torqueing set screw.

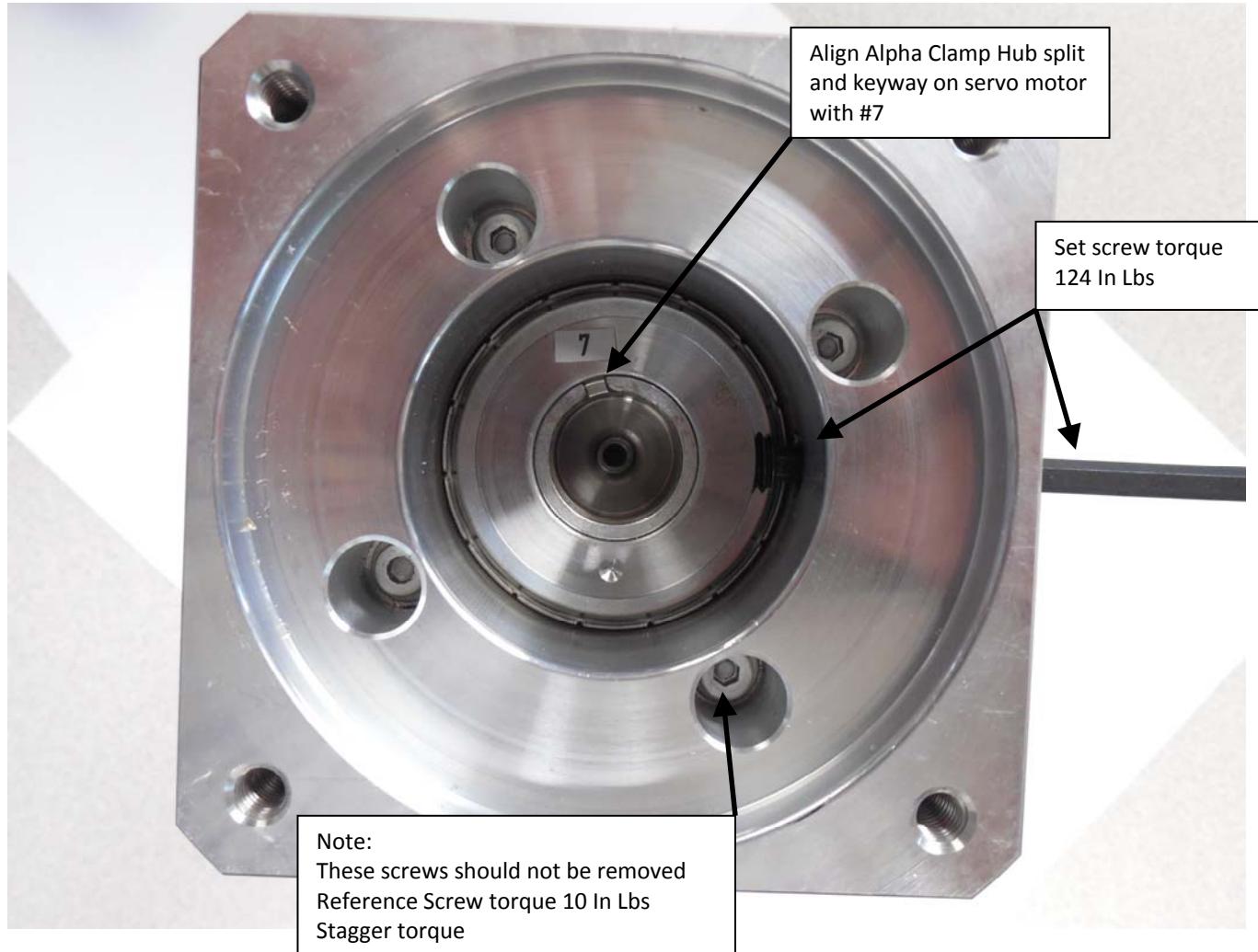
Servo/Gear Head Connection

Picture #5



- Remove oil, grease, ... from all metal components prior to assembly
- Insert Alpha Clamp Hub with slit in ring pointed at the #7 (reference picture #6)
- Insert/install servo with keyway in shaft pointed at the #7 (reference picture #6)
- Holding the Servo Motor tight to Gear Head torque the Alpha Clamp Hub set screw
- Rotate Servo Motor to line up with Gear Head bolts, insert and torque bolts
- Remove plastic and documents from servo motor

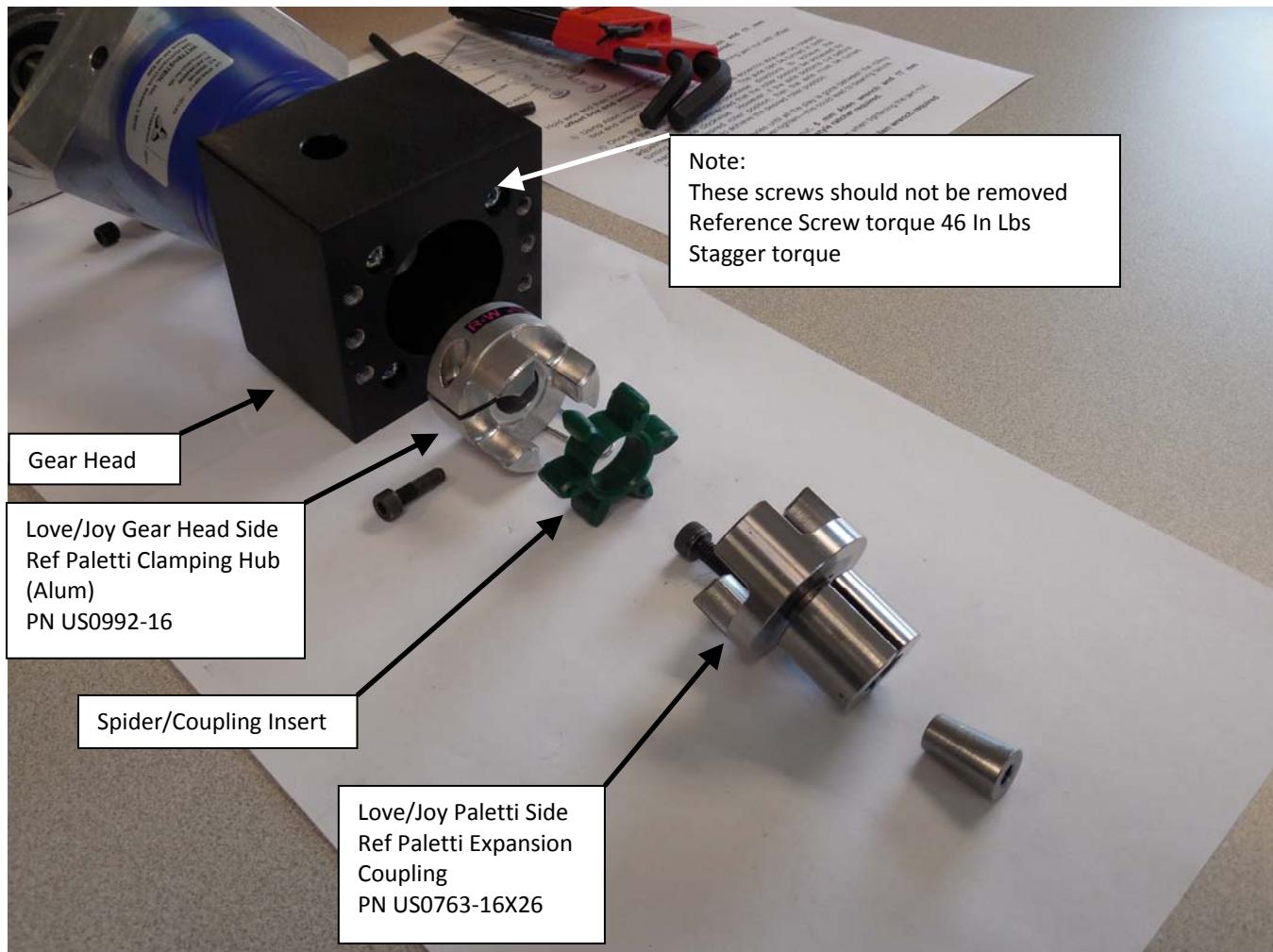
Gear Head
Picture #6



Refer to manual and drawing US-A-1109 for complete and addition details/instructions.

Paletti Coupling Assembly

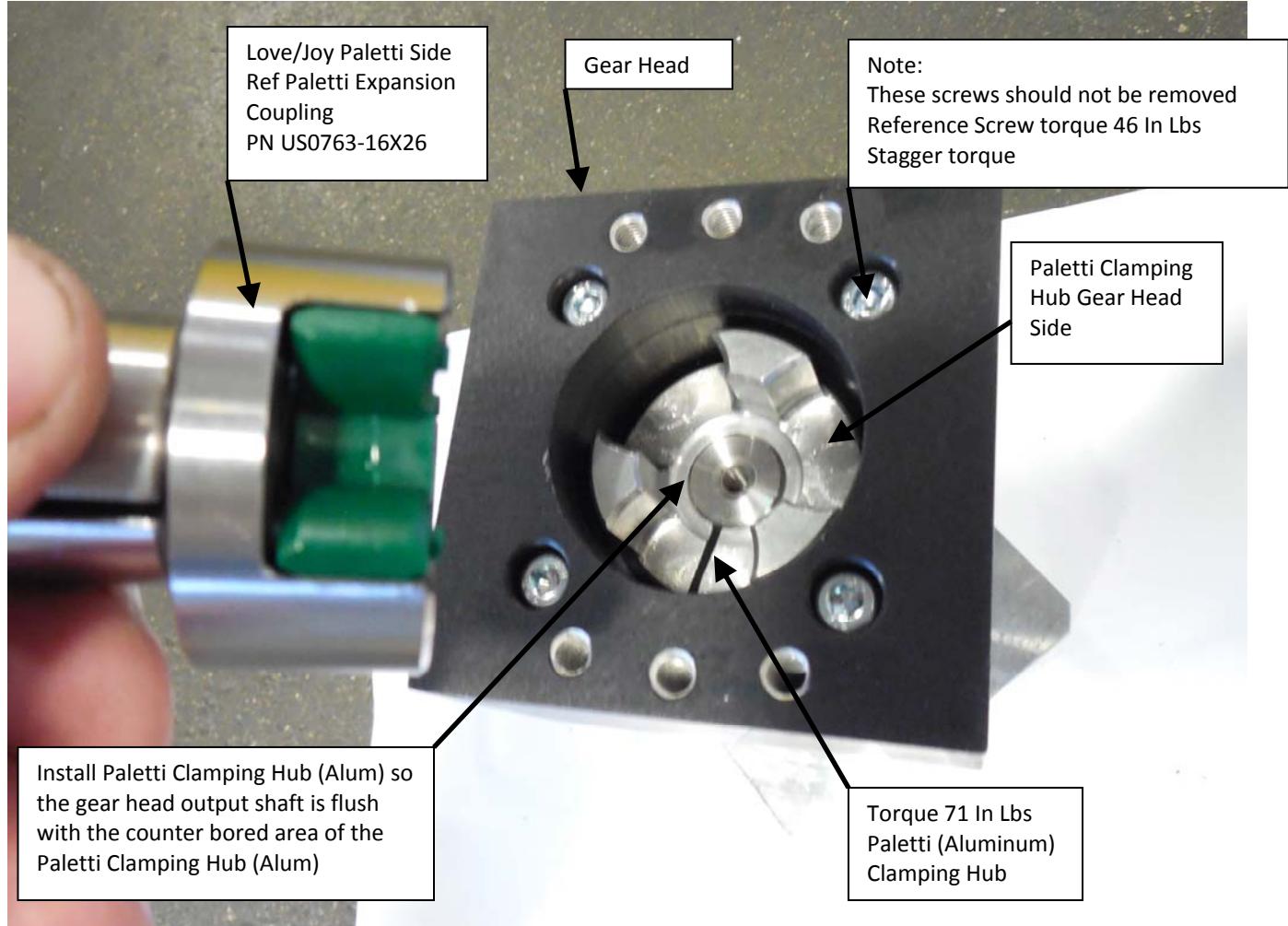
Picture #7



- Remove oil, grease, ... from all metal components prior to assembly
- Torque Paletti Clamping Hub connection (Alum), refer to picture #8 for proper placement on output shaft
- Torque Paletti Expansion Coupling connection, refer to picture #12 for proper placement/gap to Paletti unit
- Insert Spider/Coupling Insert between Paletti Clamping Hub (Alum) and Paletti Expansion Coupling
- Assemble and torque Gear Head to Paletti unit

Gear Head/Paletti Clamping Hub/Paletti Expansion Coupling Connection

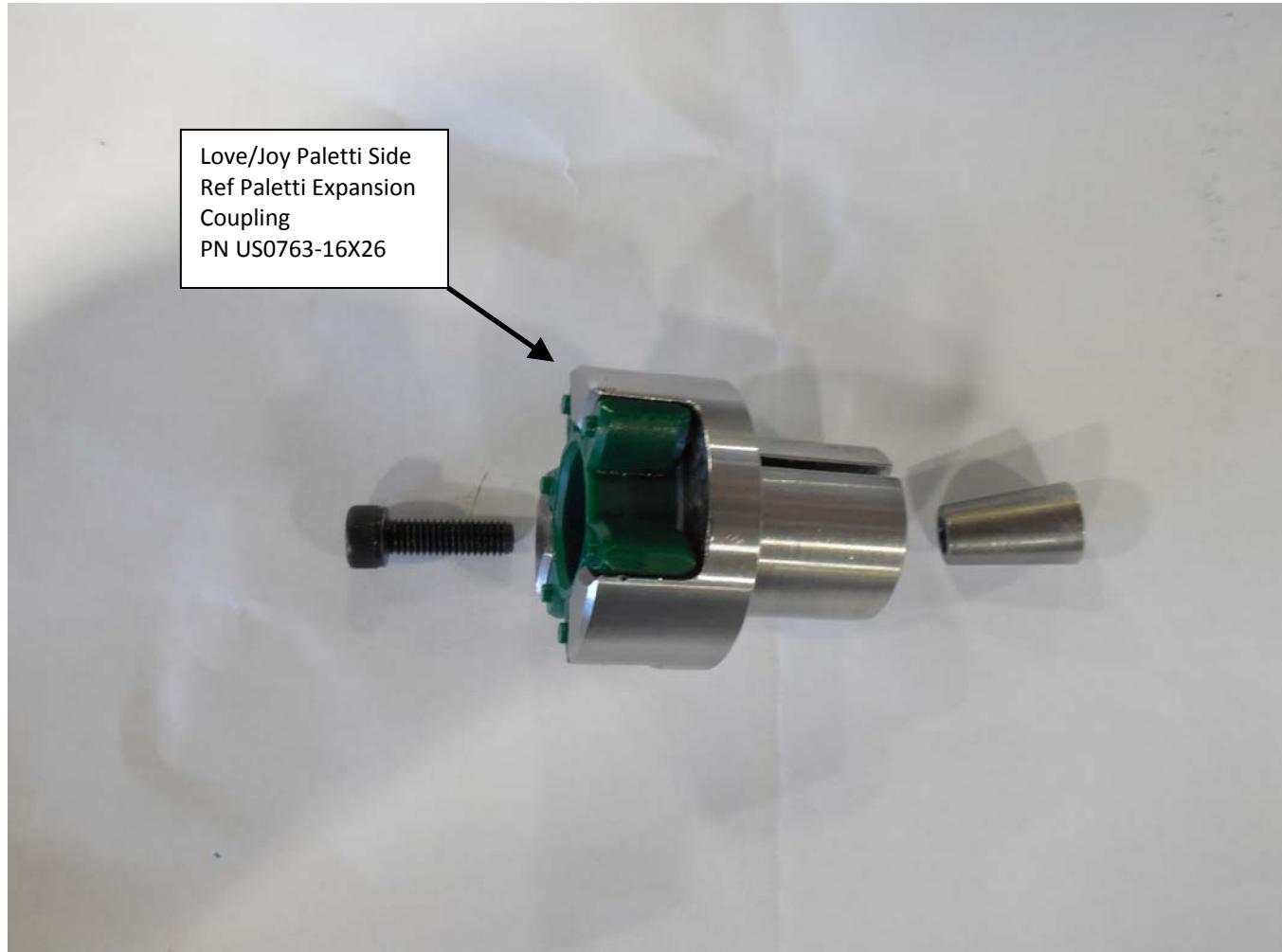
Picture #8



Install Paletti Clamping Hub (Alum) as shown in picture #8.

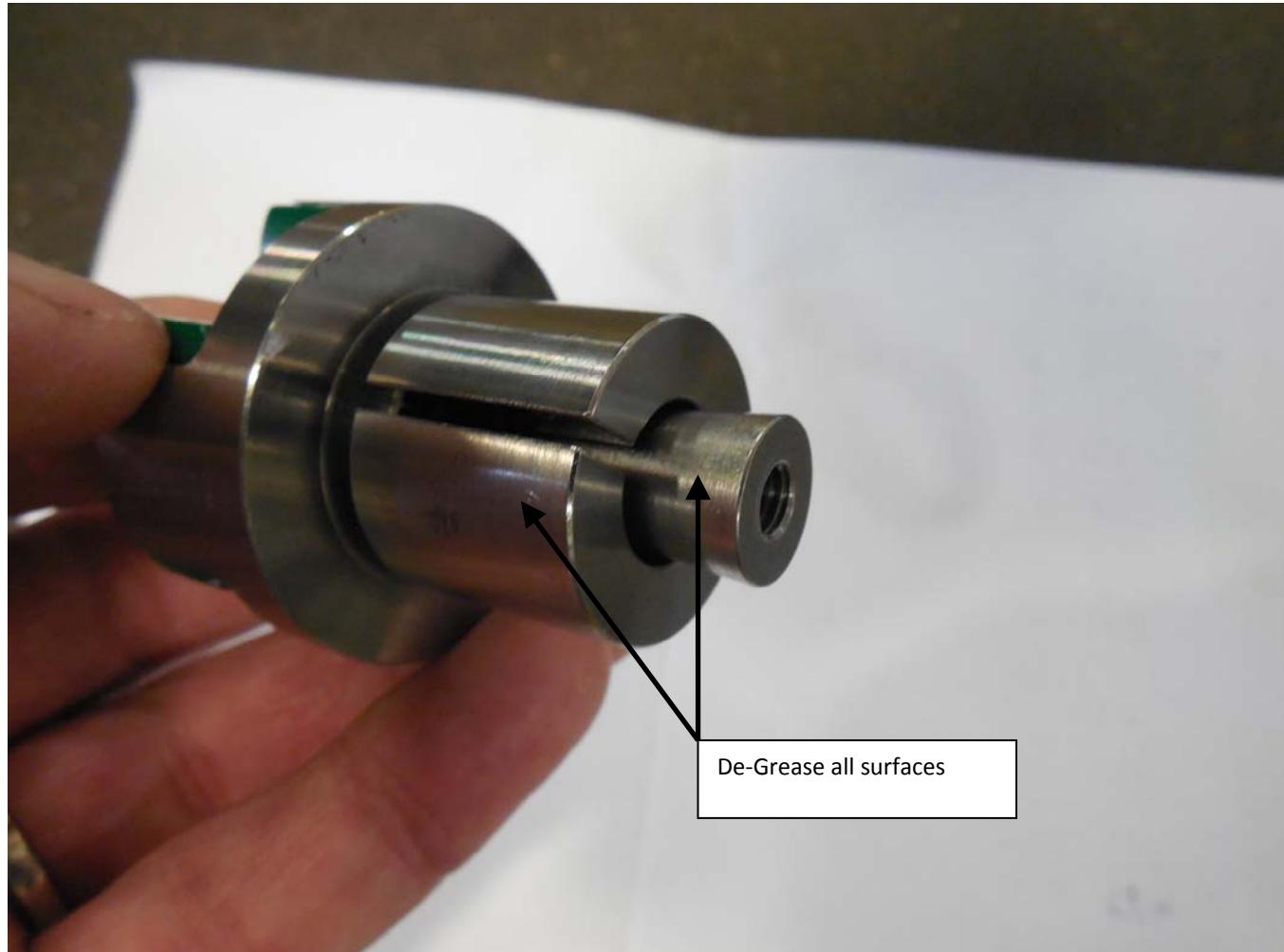
Expansion Coupling Assembly (Paletti/Gear Head)

Picture #9



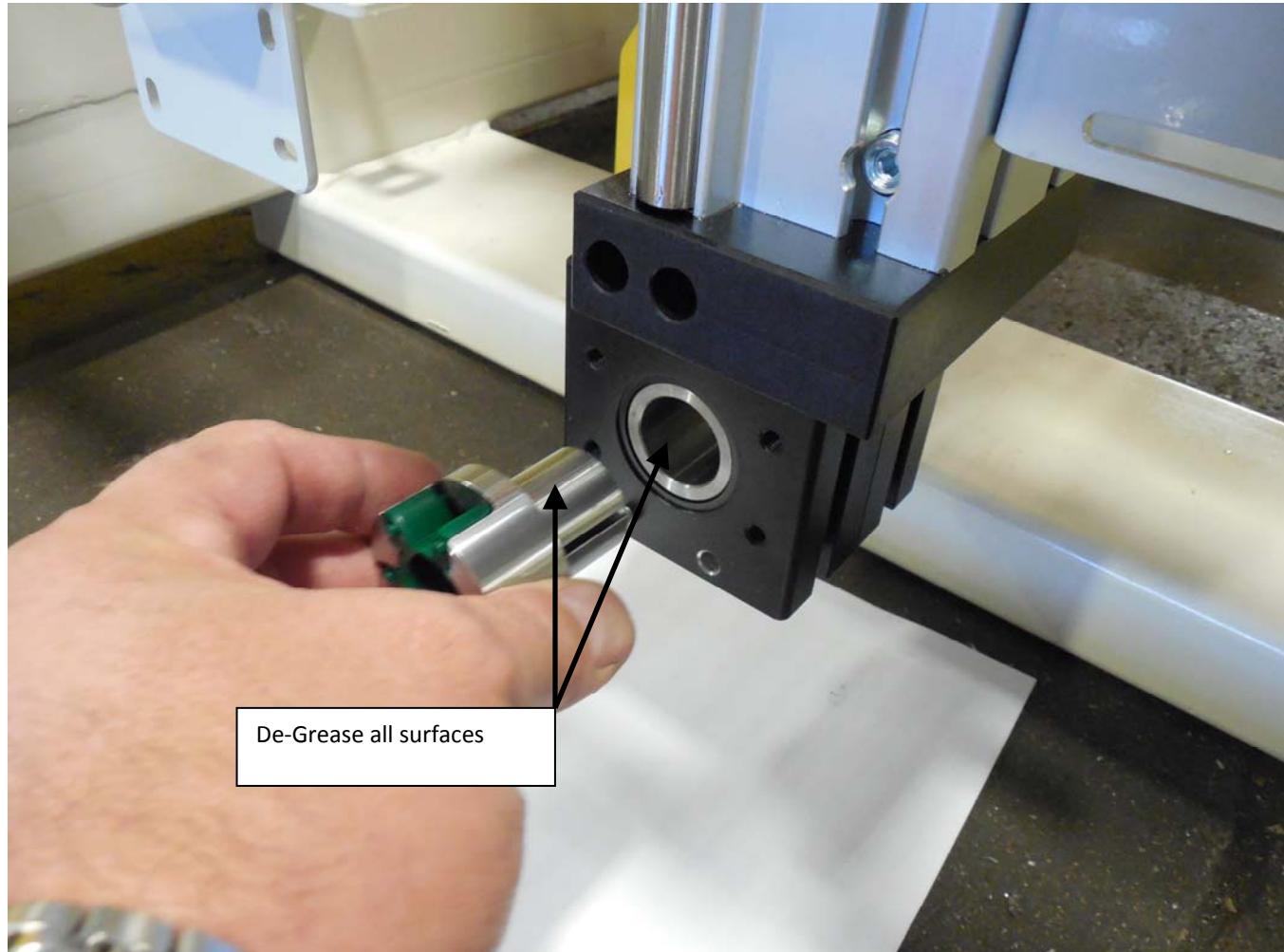
Expansion Coupling Assembly (Paletti to Gear Head)

Picture #10



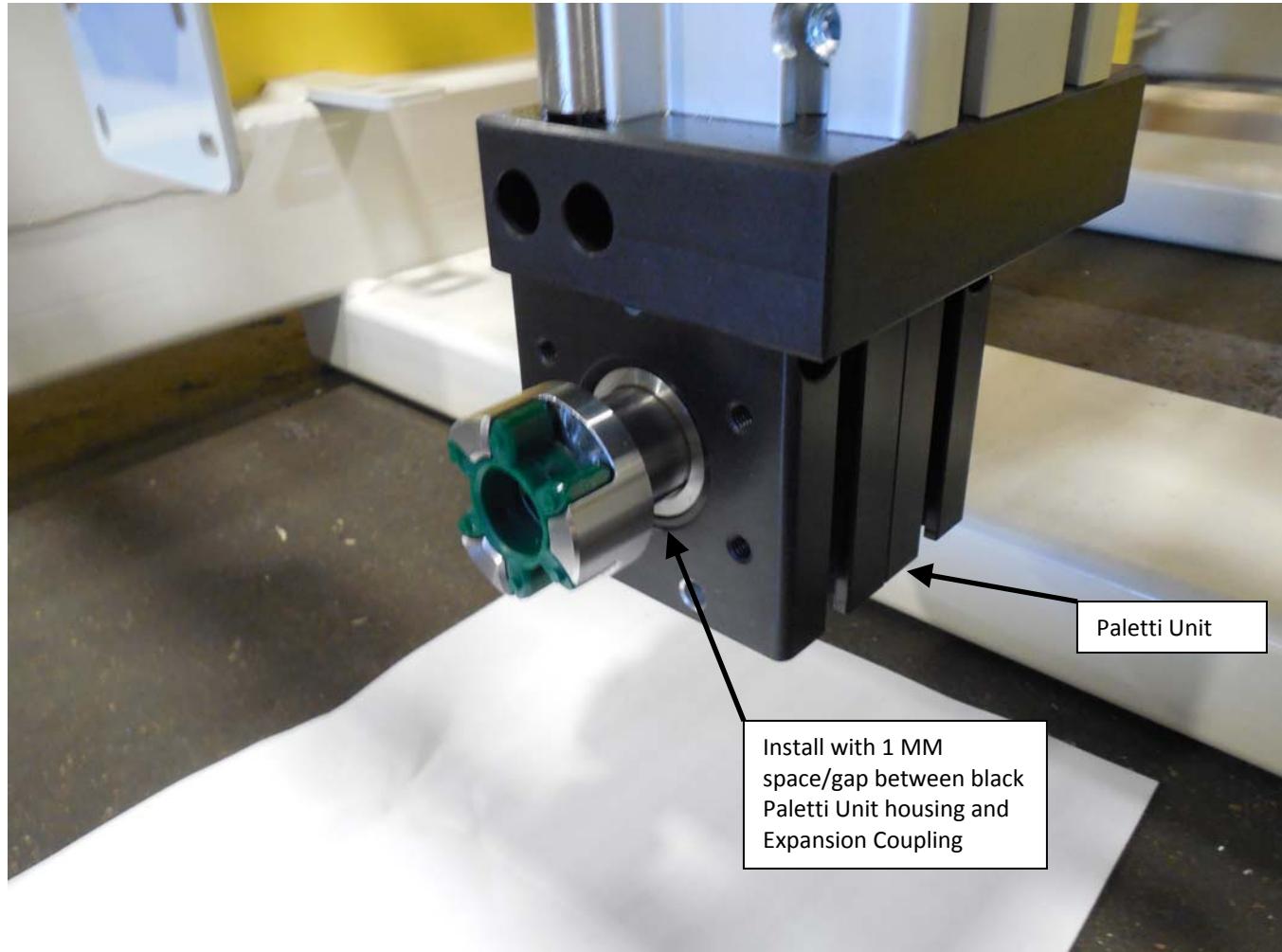
Expansion Coupling to Paletti Gear Head

Picture #11



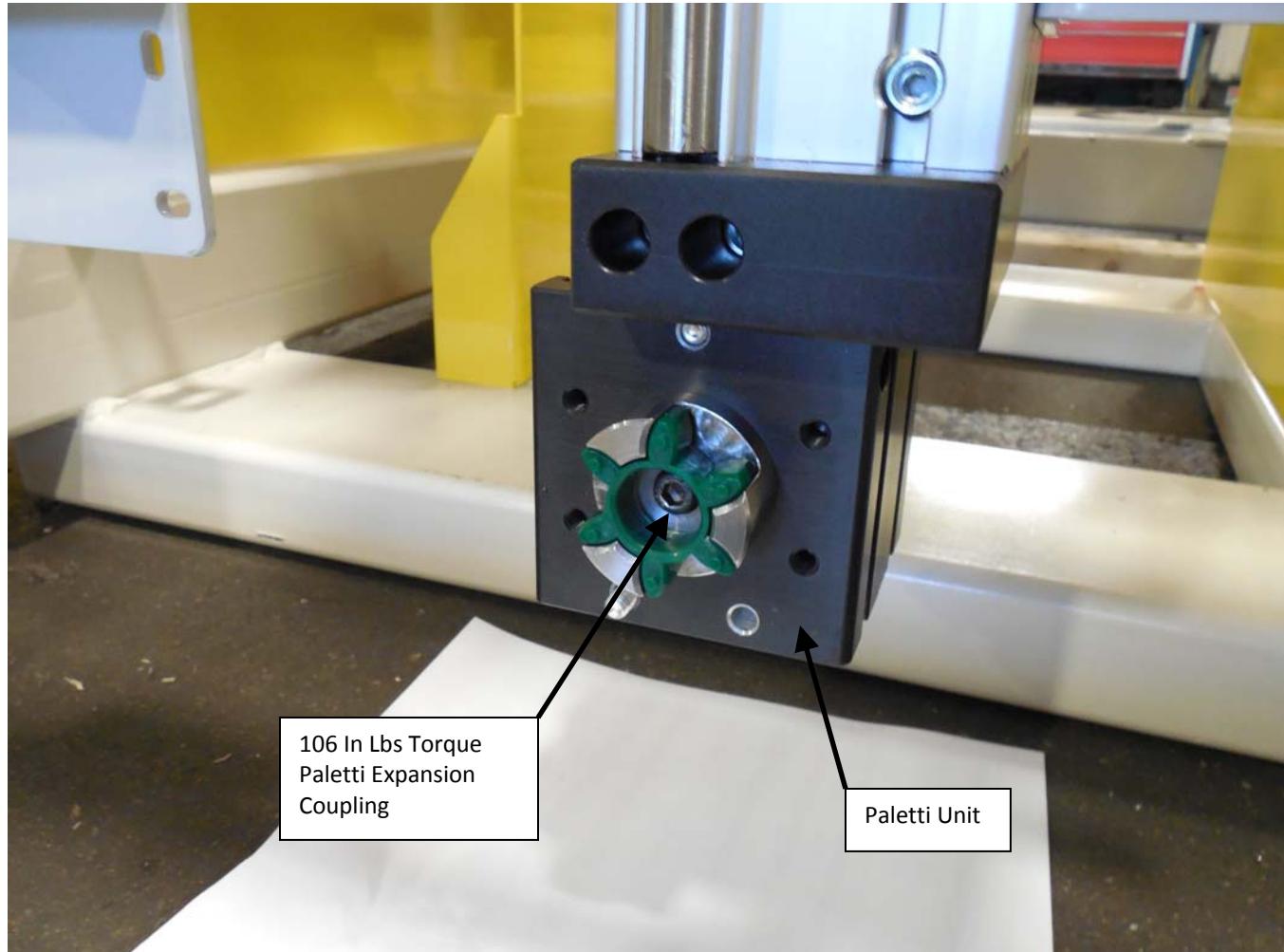
Expansion Coupling to Paletti Gear Head

Picture #12

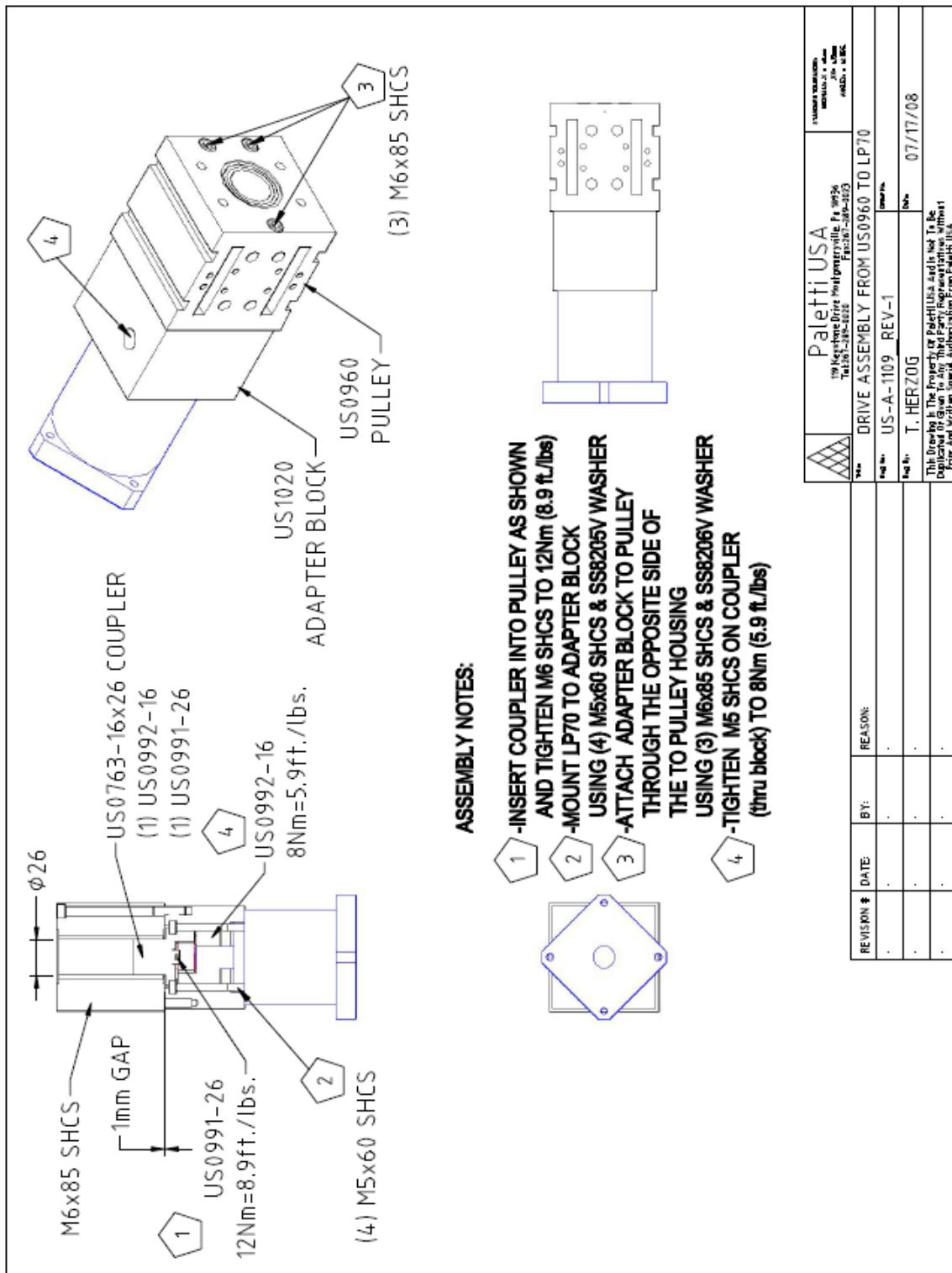


Improper gap may cause damage to coupling connection, Paletti Gear Head, and or gear box. Use 1 MM shim stock or 1 MM feeler gauge to set proper gap.

Expansion Coupling to Paletti Gear Head
Picture #13



Picture #14





Project: ST3510 Gen 3.0

Date: 04/08/2016 Revision: 01

Subject: Servo/Gear Head/Paletti Clamping Hub/Paletti Coupling Connection – Tools Required

This document identifies key tools required to repair servo connection.

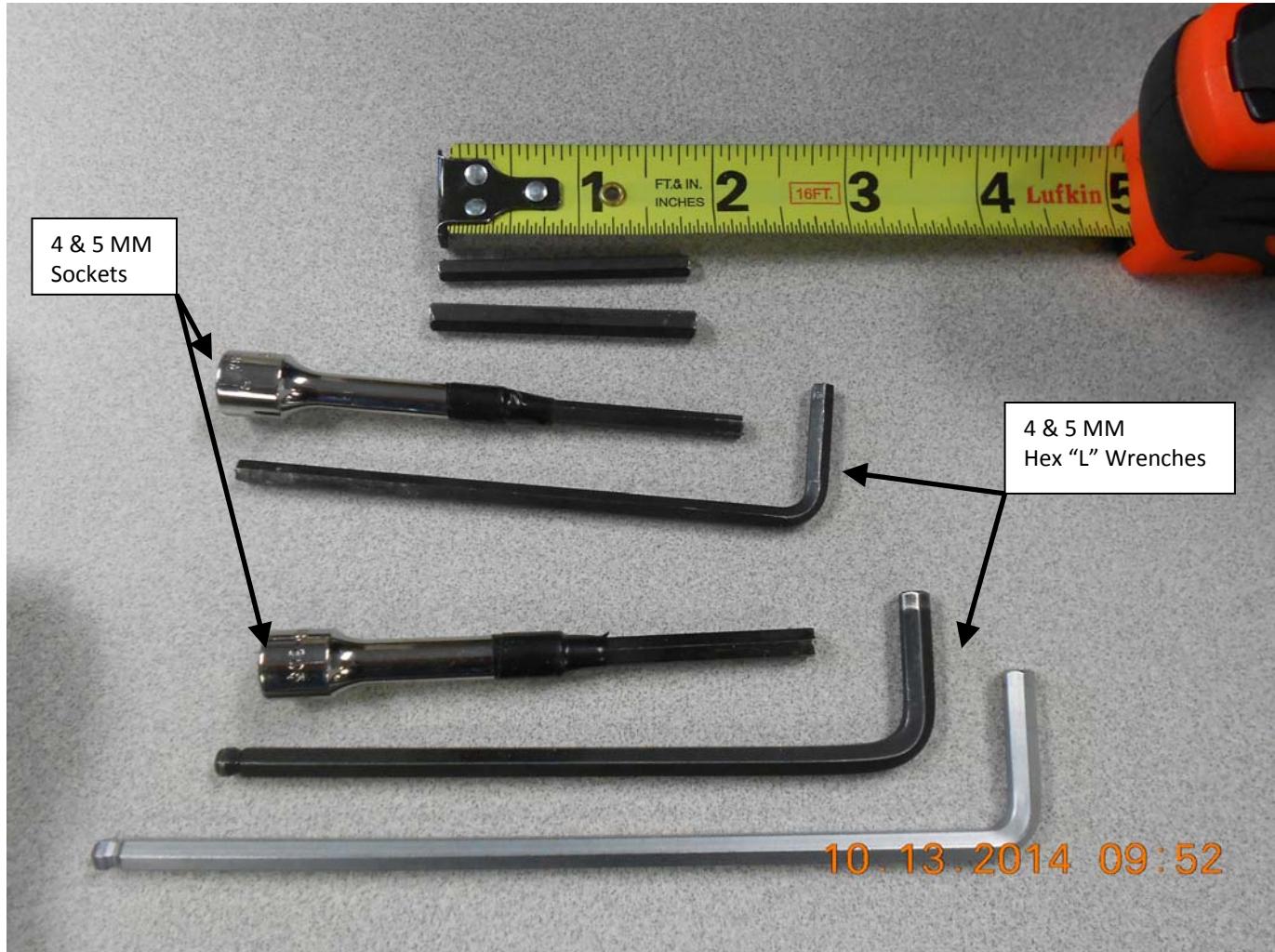
Each site will want to have in stock the following minimum tools to perform drive repairs:

- Á Ratchet strap – To secure carriage from free falling and to make minor elevation adjustments to align couplings
- Á Hammer
- Á Torque wrench with minimum torque range of 10 in Lbs to 124 in Lbs
- Á 3/4" Dia brass punch
- Á Flat bladed screw driver
- Á 7/16" Wrench – Req'd to remove guard
- Á Adjustable wrench
- Á 4MM Hex key "L" wrench
- Á 5MM Hex key "L" wrench
- Á 4MM Straight hex key socket used to re-torque components (may have to fabricate)
- Á 5MM Straight hex key socket used to re-torque components (may have to fabricate)
- Á 1MM shims (2 req'd)
- Á Pick to remove plug

See pictures below

Important note: Cleaning, installing, shimming, component alignment and placement, and torqueing to proper torques very critical. Reference manual and detailed instructions outlining how to remove and re-assemble drive components.

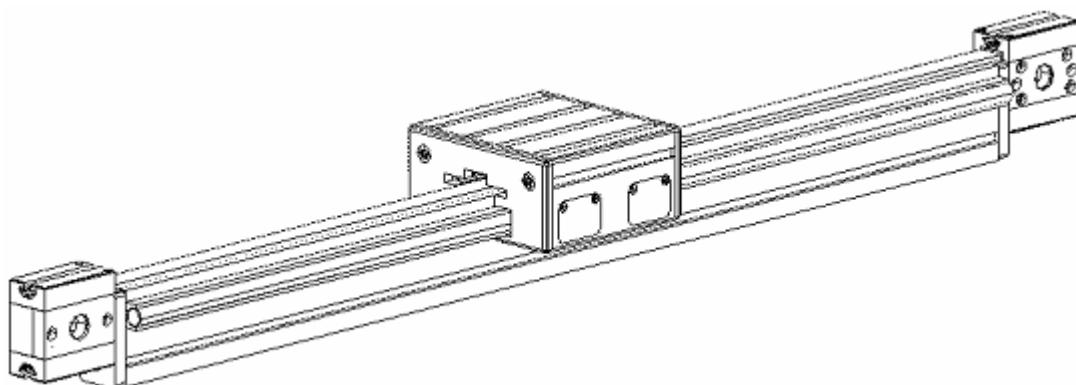




May have to fabricate your own 4MM & 5MM sockets by using 4MM & 5MM sockets and cutting 4MM & 5MM Hex stock to reach thru access holes in reducer.



Internally Tensioned Belt Driven Linear Actuator Service Manual



Scheduled Maintenance

1) Periodic Inspection – Monthly or as required by frequency of actuator cycle time.
(See figure 1)

- a) Inspect Guide Rails for rust or uneven wear.
- b) Felt pads in Wiper-Lube Unit are moist with
 #2 Way Oil, or synthetic food grade lubricant for stainless applications.
- c) Inspect belt for uneven wear.

2) Replacement of Wiper-Lube units is *recommended* every 6 months, or after 2000 hours of operation– As required by frequency of actuator cycle time.

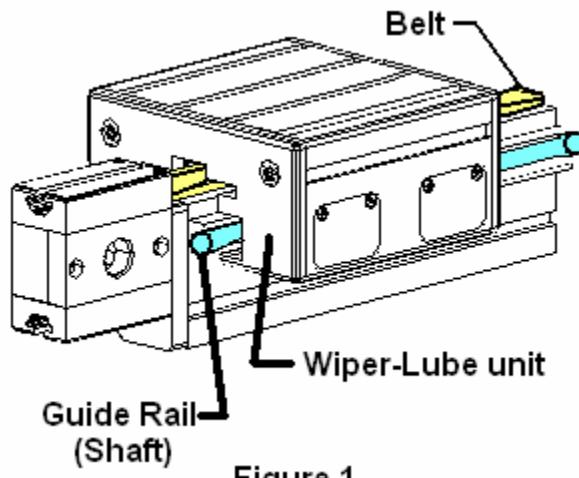


Figure 1

Tgr ckt 'cpf 'Tgr n ego gpv'qh'Y qtp'Kgo u'

F kicugo dn' 'qh'Dgn'lt qo 'Ect t kci g<'

- 1) Remove Wiper/Lube cover.
- 2) Clamp belt to track profile, in order to prevent belt from moving. (See figure 2)
- 3) Remove set screws for belt tensioner.
- 4) Use rubber mallet on face of carriage to extract tensioner from carriage body.
- 5) In extracting tensioner, be careful not to mar carriage face.

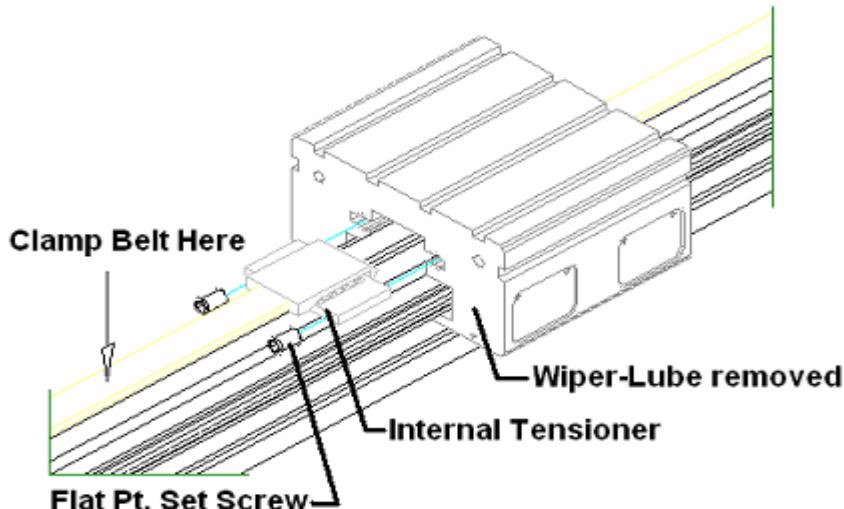


Figure 2

6) Remove belt from tensioner by pushing through the side.
DO NOT PRY TENSIONER TO SPREAD APART!

***PQVG**<Most actuators are shipped with the pulleys and belts centered on the profile. These units will always have the belts centered in the tensioner. There are some units that require the pulley and belt to be mounted to one side of the profile. For these units when the belt is not centered on the tensioner, a mark should be made on the tensioner to note where the belt should sit before disassembly.

"

"

Tgo qxenqhlRwng{ u<"

"

1) Prior to the removal of the pulleys, the motor/gearbox unit that is coupled to the pulley must first be removed.

2) Pulley housing can now be removed from the track profile by releasing the central fastener (**6'6 o 'Cnqp'y t gpej 't gs wkt gf** +or cap screws. (See figure 3)

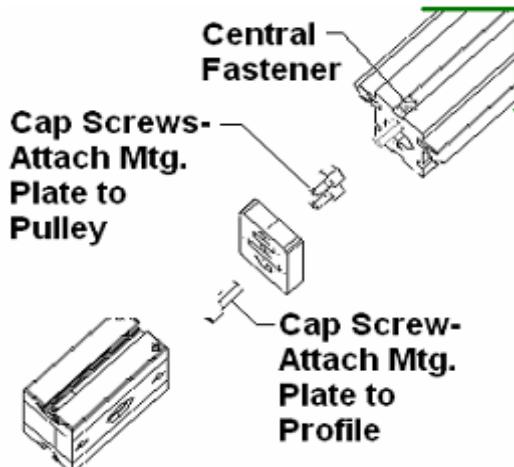


Figure 3

3) After re-assembly of the pulleys, the motor/gearbox must be coupled to the pulley.

***PQVG** *Verify that the coupling screws are tightened to the correct torque settings of the coupling. If unsure of the screws torque setting, contact your local Paletti USA representative, or contact engineering at Paletti USA: (267) 289-0020.*

Â

"

"

"

"

"

"

"

"

"

"

"

Geegpvle'czig'TTqngt 'cf lwoo gpv'Kout wekpu'

1) A Identify Eccentric axle

i) A The eccentric axles will be stamped on the underside of the carriage with a capital 'E.' The concentric side will be stamped with a capital 'Z,' from the German for 'Zentric.'

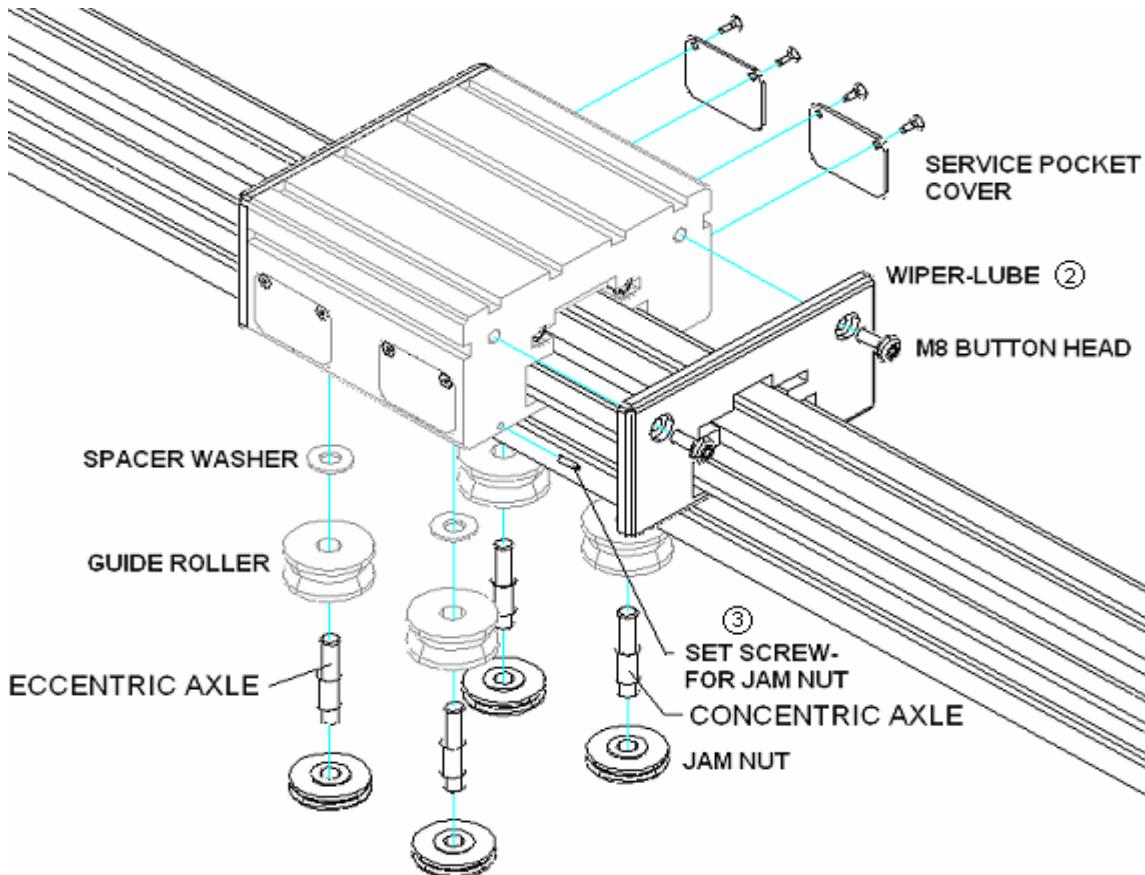
2) A Remove Wiper and Lubricator (WL); 7'b o 'Cmp'y tgej 'tgs wkgf "

i) A Remove WL, if present. WL's are the black plastic plates that hold the spring loaded felt pad. Part numbers are typically: SL0162S and SL0164S. A pair of M8 Button Head Cap Screws (BHCS) holds the wiper and lubricator to the carriage. Typically, these wiper and lubricators are pinned together.

(1) A Note: If the halves of the WL are not pinned together, it is only required to remove the WL halves that are on the eccentric side of the carriage.

3) A Loosen Set screw in the end of the carriage. This set screw holds the jam nut that holds the Axle; 5'b o 'Cmp'y tgej 'tgs wkgf

i) A CAUTION: If this set screw is not loosened, further adjustment may damage carriage and void warranty.



I DÁ P[|åÁæ| ^ Áæ å Á @ } Á[[•^ } Áæ Á ^ d Á 5 mm Allen wrench and 17 mm offset box end wrench or thru style ratchet required.

Á

á Á W• á * Á Ø{ |^ } Á |^ } & @ Á Q |å Áæ| ^ Áæ ^ å Á @ ^ Á[[•^ } á * Áæ Á ^ Á æ@ Á ~ ^ Á
à[ç Á } å Á |^ } & @ Á | Á @ ^ Á c | ^ Á æ & @ d Á

Á

á Á U } & Á @ Áæ Á ^ Á @ Á ^ Á ^ Á } Á[[•^ } ^ á E @ Á & & } d Á Á | ^ Á & Á Á ^ Á[c e ^ Á
ç Á ^ Á @ Á [• á Á } Á Á @ Á ^ Á @ Á ^ Á Á ^ Á [|| ^ | E Á @ Á | ^ Á & Á Á ^ Á | } ^ á Á Á [c @ Á
& [& , á ^ Á æ å Á @ Á | ^ } c | & [& , á ^ Á å Á ^ & c | } • Á Á & @ c ^ Á @ Á
æ b • q ^ } d Á Á Á ^ & { { ^ } á ^ å Á @ Á @ Á [|| ^ | Á [• á Á } Á ^ Á & @ c ^ Á ^ Á ^ Á
c | } á * Á @ Á @ Á | ^ Á [& , á ^ E Á P [, ^ c | E Á @ Á | ^ Á [& { { • Á ^ d Á ^ f | ^ Á
| ^ & @ á * Á @ Á ^ Á • á ^ Á Á [|| ^ | Á [• á Á } E Á @ } Á @ Á @ Á | ^ Á ^ • á ^ Á | } ^ á Á
& ^ } c | & [& , á ^ Á Á & @ c ^ Á @ Á ^ Á • á ^ Á Á [|| ^ | Á [• á Á } E Á

Á

á Á Ü [c e ^ Á @ Á & & } d Á Á | ^ Á } c Á Á @ Á | æ Á Á [} ^ Á ^ c ^ Á ^ Á [|| ^ | Á
æ å Á @ Á @ e Á O [Á [c Á c ^ | E Á @ ^ } . c @ Á | ^ | Á Á ^ æ Á Á ^ æ Á * Á æ | ^ E Á

Á

I DÁ Á P[|åÁæ| ^ Áæ å Á @ } Áæ Á } ^ d Á 5 mm Allen wrench and 17 mm offset box end wrench or thru style ratchet required.

Í D T æ ^ Á ^ | ^ Á @ Á @ Á @ Á @ Á [^ • Á [d Á | } Á @ } Á @ } á * Á @ Áæ Á ^ d Á

Í DÁ Væ @ ^ } Á ^ c Á & ! ^ , Á } c Á æ Á ^ d Á 3 mm Allen wrench required

á Vá @} Á^oÁ&^, Á•oÁ@Á[á o@Á@Á{ á { Á|*^•Á|á * @^ ÉÁ
V@ Á@{ |{ æ} Á} •^ |^•Á@Á@Á^ o&^, Á@ Á[{ ^Á|^|[æ} Á} Á@ Á
Ö[Á[oç^|Á@} ÉÁ
Á
í DÁ Ora& Á| Á@ Á@ |LÁ 5 mm Allen wrench required

JDÁ Ô^ &| Á} ác, æ^ Á@ Á@ Á} •^ |^ Á|[] ^| Á] ^|æ} ÉÁ

At any point, if there are questions, contact your local Paletti USA representative, or contact engineering of Paletti USA at: (267) 289-0020.

Belt Tensioning Assembly Instructions with Internal Belt Tensioners

Disassembly:

- 1) Remove Wiper/Lube cover.
- 2) Clamp belt to track profile.
- 3) Remove set screws for belt tensioner.
- 4) Use rubber mallet on face of carriage to extract tensioner from carriage body.
- 5) In extracting tensioner, be careful not to mar carriage face.
- 6) Remove belt from tensioner by pushing through the side. DO NOT PRY TENSIONER TO SPREAD APART!
If the belt is not centered on tensioner when removed from the carriage, make note on tensioner to show where to place the belt.

Pulley housing can now be removed from the track profile by releasing the central fastener or cap screws.

Re-Assembly:

- 1) CENTER belt in tensioner, or align with old position.
- 2) Carefully use a rubber mallet to push the tensioner back into the carriage so that the end is flush with the carriage face.
- 3) Insert set screws so that they are flush with the face of the carriage.

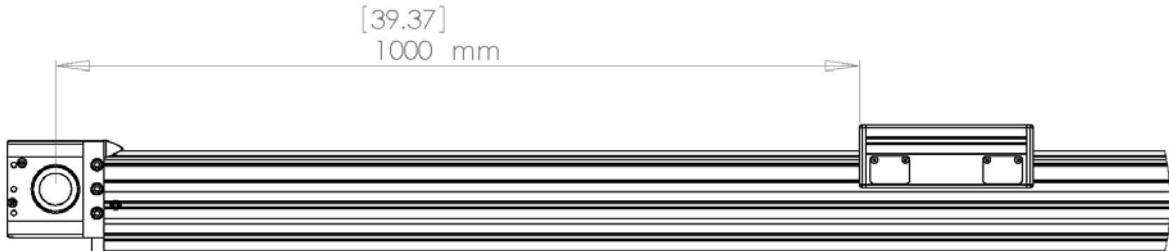
The belt should no longer be loose, but is not tensioned!

- 4a) If unit is less than 1 meter long, move the carriage to one end.
- 4b) If unit is greater than 1 meter, move the carriage so that there is 1 meter from the carriage to the pulley housing.
- 5) Continue to push tensioner in with set screws to achieve required tension.
22mm Belt) When tensioned, the belt should be able to make $\frac{1}{2}$ rotation (180 deg.)
50mm Belt) When tensioned, the belt should not be able to make $\frac{1}{4}$ rotation (90 deg.) About 75 deg. is enough.

Saturate felt wipers with #2 Way Oil and apply to rails
Fully cycle actuator twice and the actuator is complete.

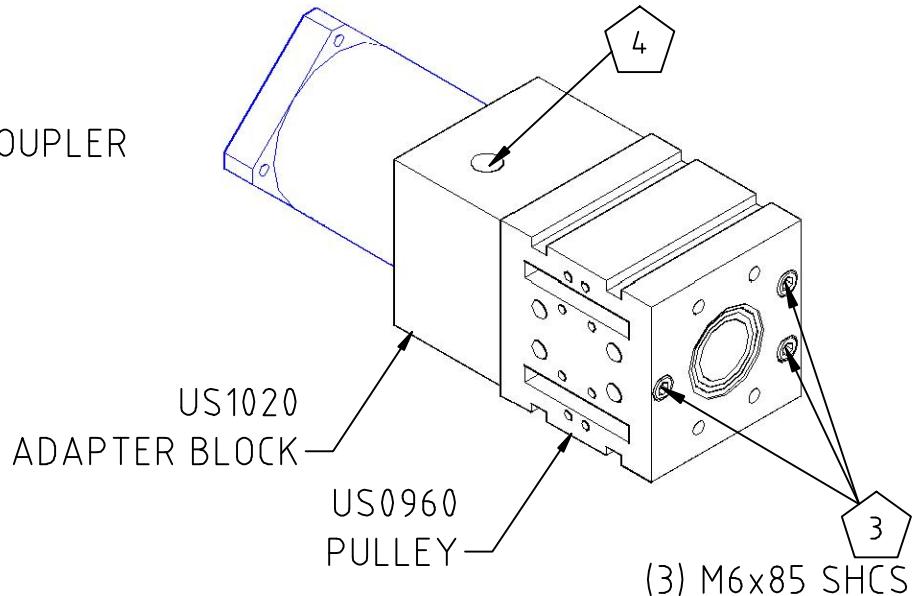
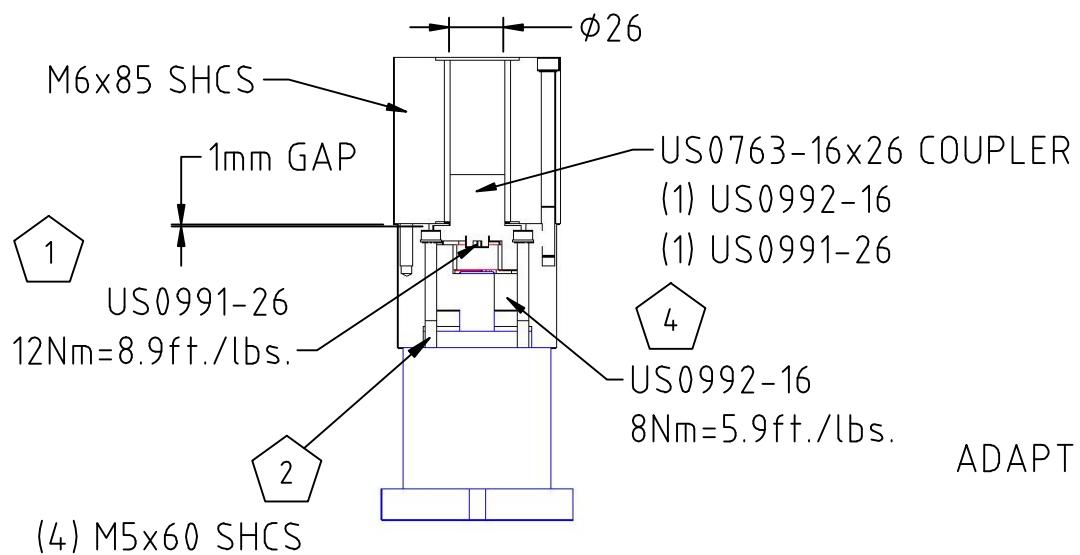
Dgn'Vgpukqpplpi 'y kqj 'ht gs wgpe{ 'b gvgt "

- Position the carriage on the rail so that the face of the wiper lubricator is 3222'b knlo gwgtu"5; 69ö+from the center of the reversing unit.

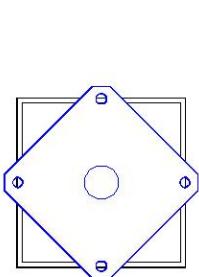


- While holding the tension meter about 10mm from the belt (at the center of the span) lightly tap the belt making sure the belt doesn't contact the aluminum profile or the tension meter in the process.
- Repeat this process multiple times until you obtain a consistent reading.
- Adjust the tensioning screws in the carriage accordingly until the belt reaches the desired frequency. (Tightening the screw to raise the frequency & loosening to lower)

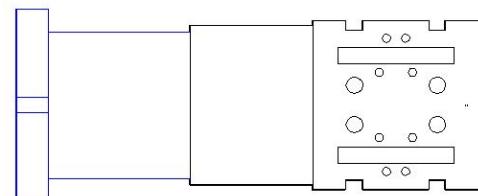
The factory set frequency value for this unit is: **29Hz @ 1000mm**



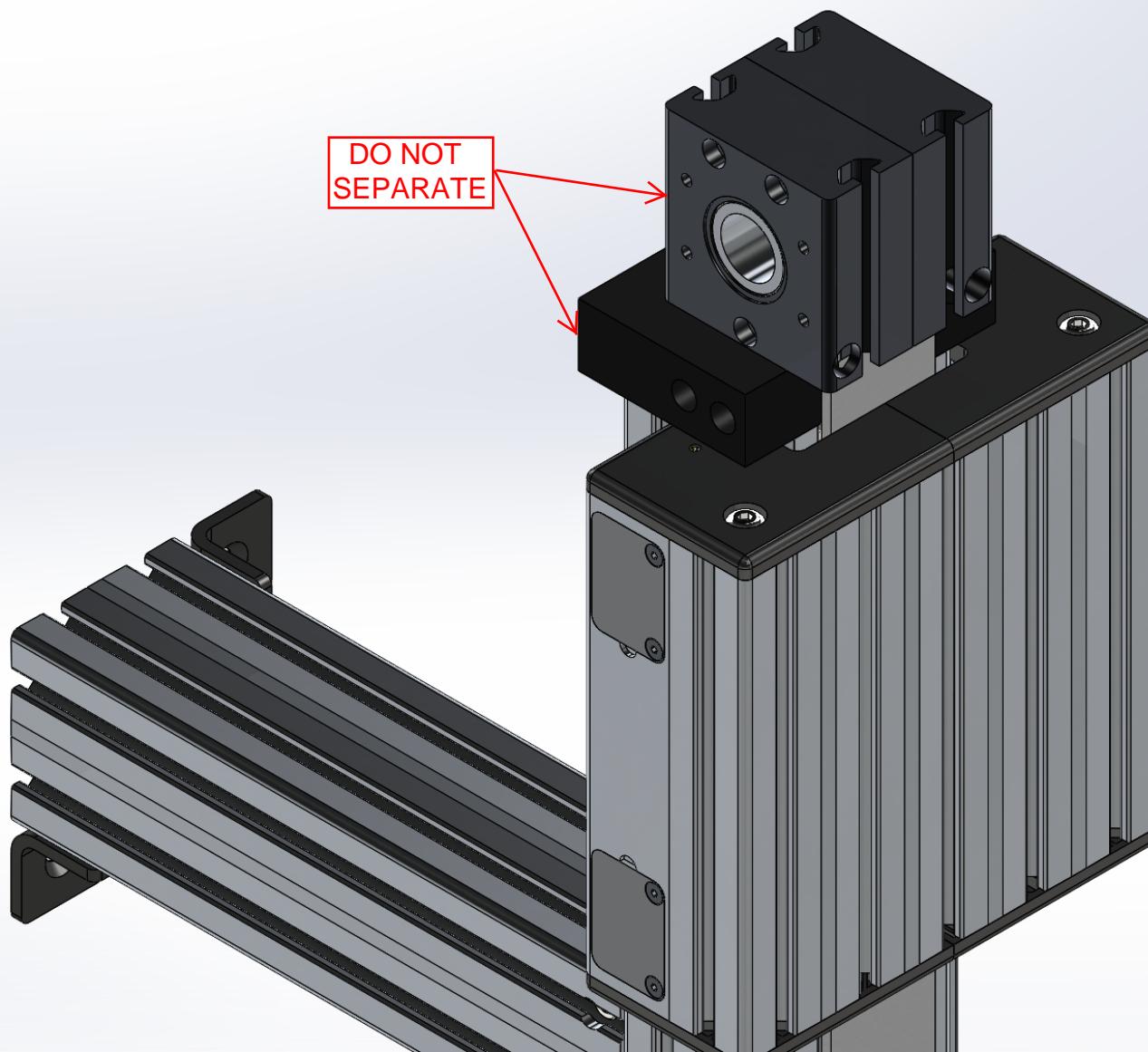
ASSEMBLY NOTES:

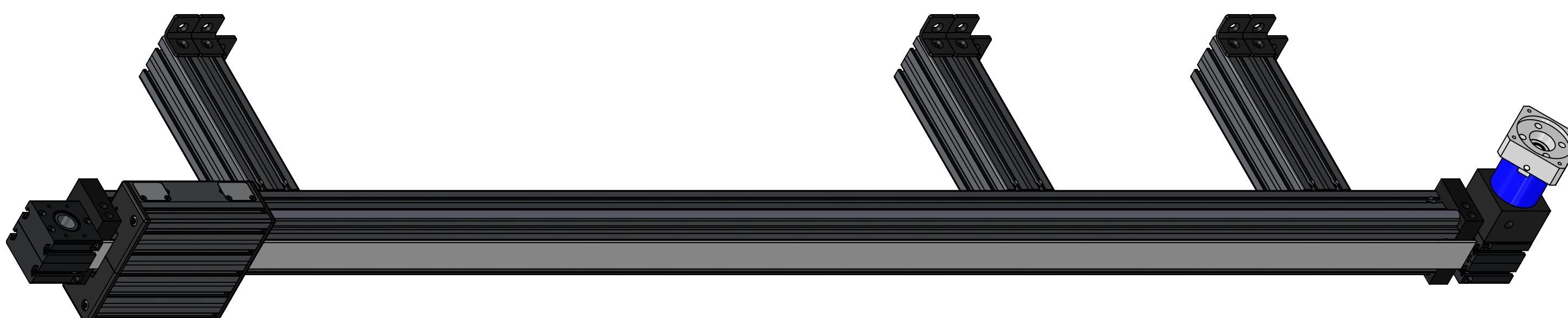
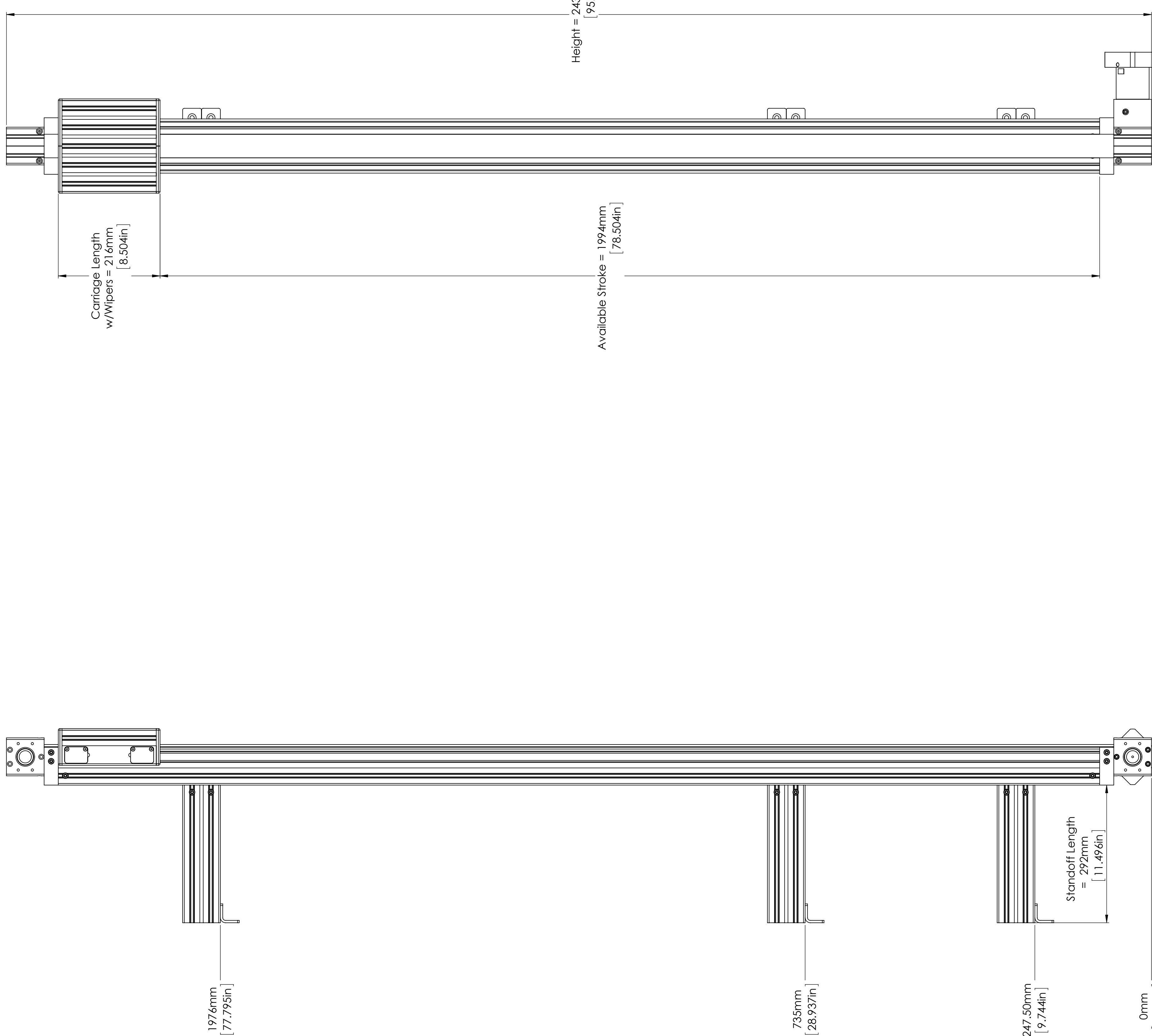


1. -INSERT COUPLER INTO PULLEY AS SHOWN AND TIGHTEN M6 SHCS TO 12Nm (8.9 ft./lbs)
2. -MOUNT LP70 TO ADAPTER BLOCK USING (4) M5x60 SHCS & SS8205V WASHER
3. -ATTACH ADAPTER BLOCK TO PULLEY THROUGH THE OPPOSITE SIDE OF THE PULLEY HOUSING USING (3) M6x85 SHCS & SS8206V WASHER
4. -TIGHTEN M5 SHCS ON COUPLER (thru block) TO 8Nm (5.9 ft./lbs)



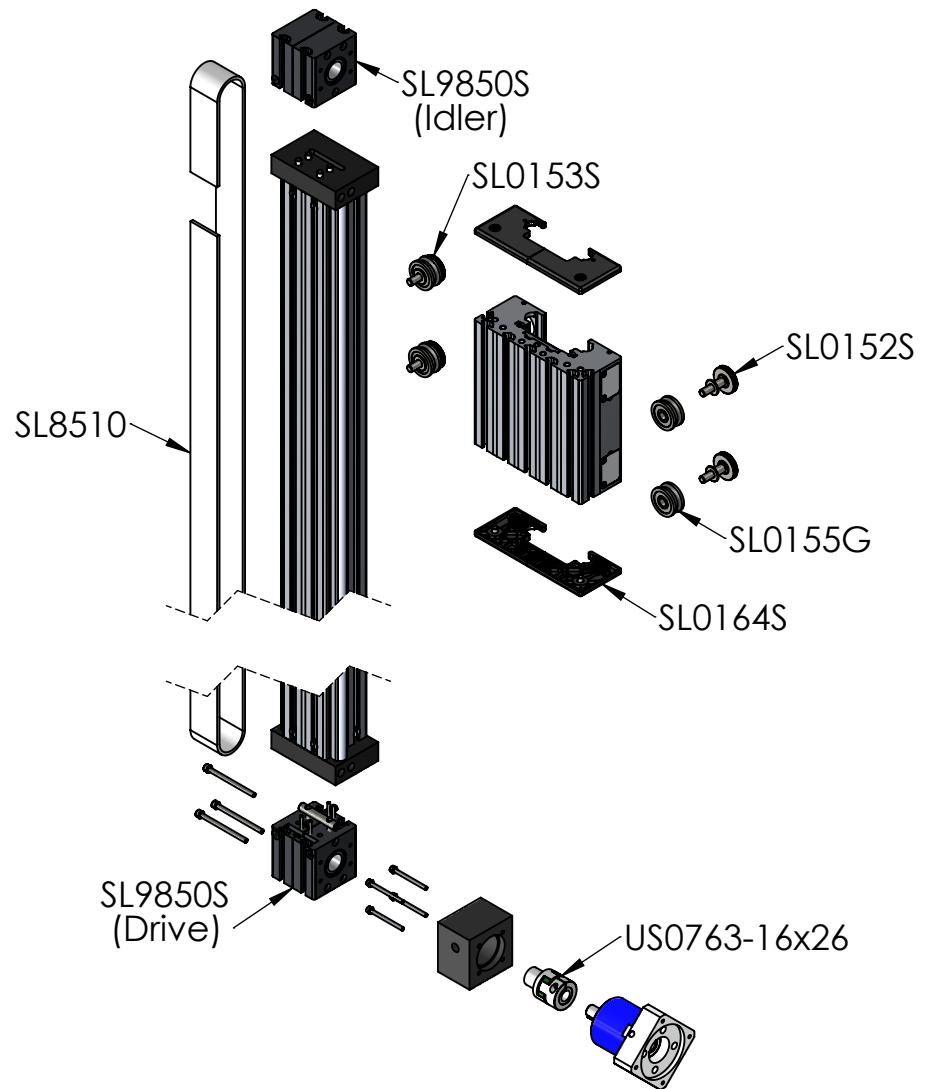
	Paletti USA 119 Keystone Drive Montgomeryville, Pa 18936 Tel:267-289-0020 Fax:267-289-0023	STANDARD TOLERANCES: DECIMALS: X = ± 0.5 mm JX = ± 0.3 mm ANGLES: = ± 2 DEG.
REVISION #	DATE:	BY:
.	.	.
Title: DRIVE ASSEMBLY FROM US0960 TO LP70		
Dwg. No.:	US-A-1109_REV-1	Order No.
Dwg. By:	T. HERZOG	Date: 07/17/08
This Drawing Is The Property Of Paletti USA And Is Not To Be Duplicated Or Given To Any Third Party Representatives Without Prior And Written Special Authorization From Paletti USA		





Proprietary and Confidential: The information contained in this engineering copy is the sole property of Poletti USA LLC. Any reproduction in part or as a whole without the express written consent of POLETTI USA LLC is prohibited.		Poletti USA LLC 145 Keystone Drive Montgomeryville, PA 18936 Phone: 267-289-0020 Fax: 267-289-0023 http://www.poletti.com
FINISH:	Corrosion Coatings Screw Edge Min. /0.010 in. A Screw - 0.010 in. B	Description: Corrosion Coatings NAME: <input checked="" type="checkbox"/> <input type="checkbox"/> DATE: 2/1/2014 <input type="checkbox"/> Turbose 4/8/2014 <input type="checkbox"/> Kishmids 4/8/2014 <input type="checkbox"/>
MATERIAL:		Material: Steel Revision #: 1
DRAWN:		Drawn by: Turbose Checked by: Kishmids
DESCRIBE:		Description: Mounting Standard Positions Chaged
REVISION #:		Revision #: 1
SIZE:		DWG. NO.: D
SCALE:		2014-01-8049-101
LOCATION:		Sheet 1 of 1

Spare Component	Description
SL9850S (Drive)	Tooth Belt Guide 80/90 (Machined for Drive Mount Package)
SL9850S (Idler)	Tooth Belt Guide 80/90
SL0155G	Roller 16
SL0152S	Roller Axle, Concentric
SL0153S	Roller Axle, Eccentric
SL0164S	Wiper & Lube System
SL8510	Timing Belt AT10/50 @ 4900mm length
US0763-16x26	Expansion Shaft/Bore Coupler, 16mm bore x 26mm shaft



PROPRIETARY AND CONFIDENTIAL
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF PALETTI USA, LLC. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF PALETTI USA, LLC IS PROHIBITED.

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN MILLIMETERS
STANDARD TOLERANCES:
ANGULAR: ± 0.5 DEG
ONE PLACE DECIMAL: ± 0.1
TWO PLACE DECIMAL: ± 0.05

FINISH:
Saw Edge -A- // 0.1 A
Side -B- \perp 0.1 B ✓ 3.2

MATERIAL:

Revision # Reason:

Description: Linear Actuator
16 - 80 x 80 Spare Parts

NAME DATE

DRAWN T Ambrose 4/23/2014

CHECKED



Paletti USA, LLC
145 Keystone Drive
Montgomeryville, PA 18936
Phone: 267-289-0020
Fax: 267-289-0023
<http://www.paletti-usa.com>

SIZE DWG. NO.

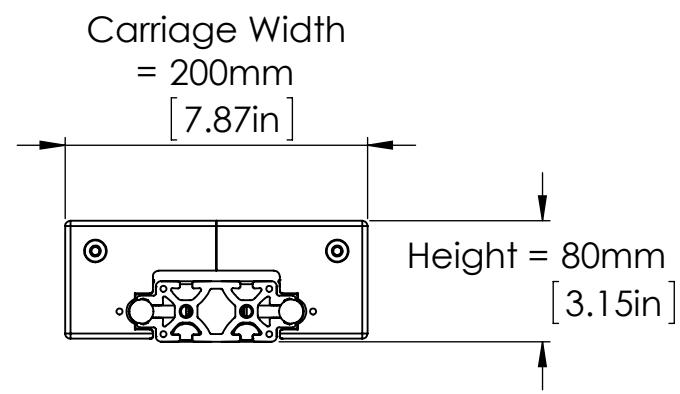
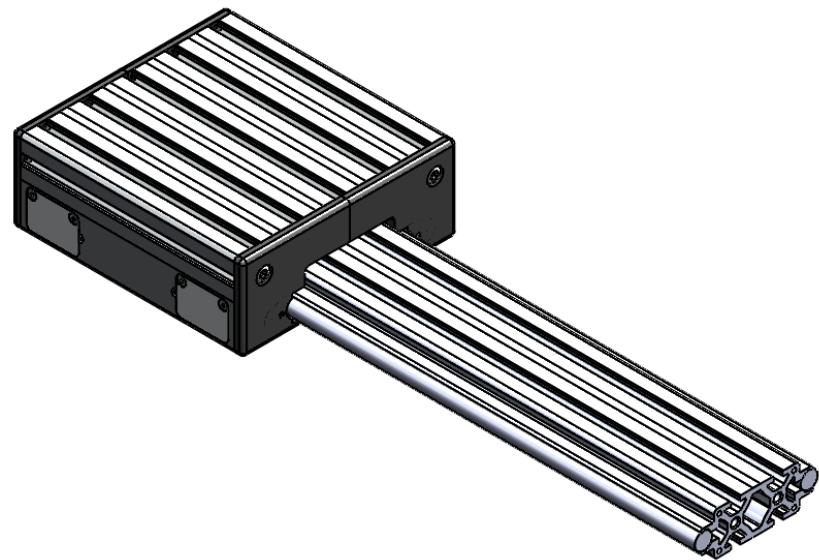
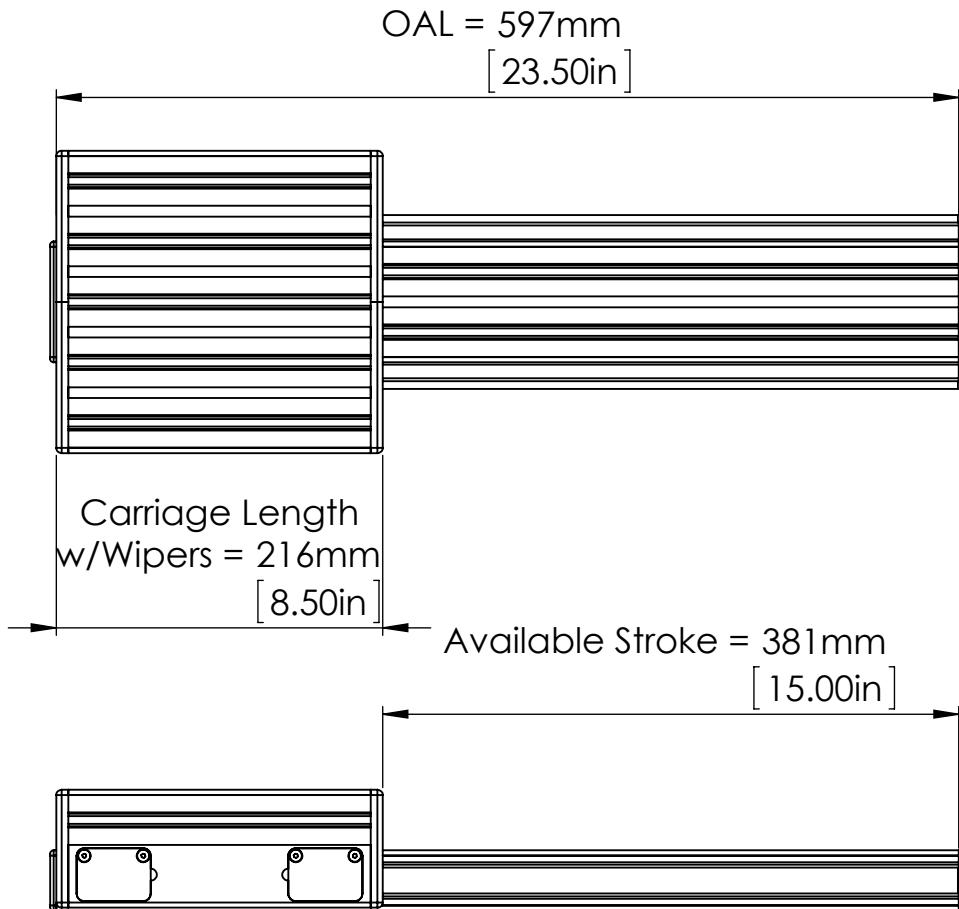
A

SL5076N2210

SCALE 1:10

Sheet1 of 1

Location: \\SBS2008\SharedFolder\Sales\Quotes\2014 Quotes\01-Jan 2014\2014-01-8049_Kendall-Conveyor Concepts actuator\2014-01-8049-10\SL5076N2210\



PROPRIETARY AND CONFIDENTIAL
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF PALETTI USA, LLC. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF PALETTI USA, LLC IS PROHIBITED.

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN MILLIMETERS
STANDARD TOLERANCES:
ANGULAR: ± 0.5 DEG
ONE PLACE DECIMAL: ± 0.1
TWO PLACE DECIMAL: ± 0.05

FINISH:
Saw Edge -A- // 0.1 A
Side -B- ⊥ 0.1 B ✓
3.2

MATERIAL:

Revision # Reason: CHECKED

Description: Linear Guide
16-40x80/80

NAME DATE

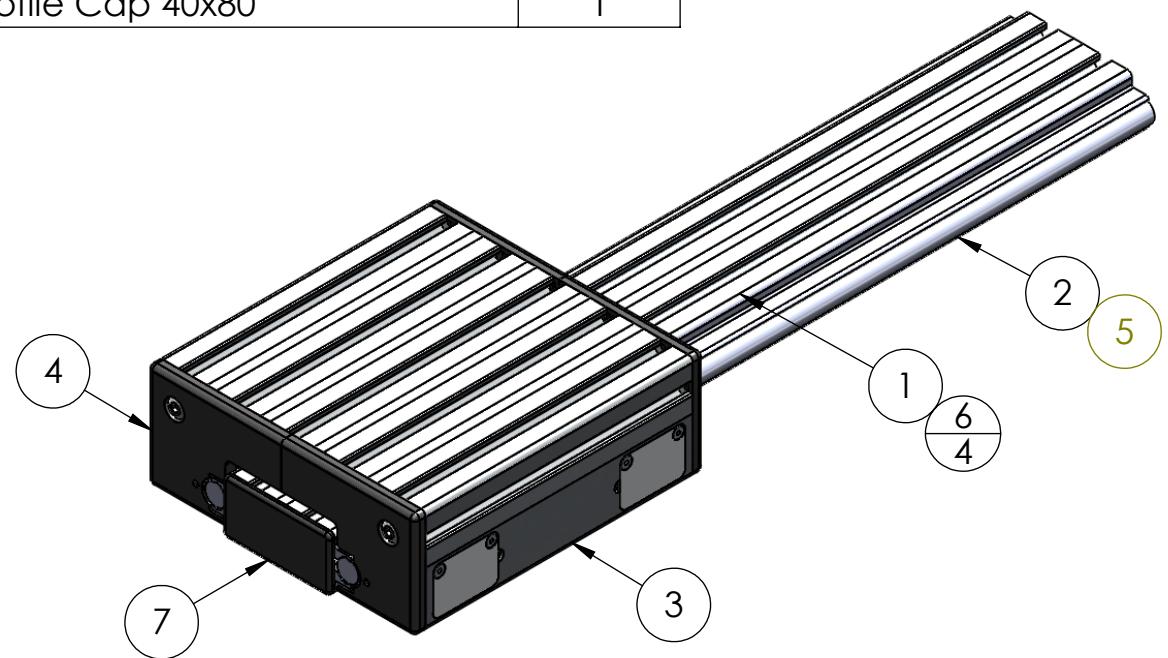
DRAWN tambrose 1/21/2015



Paletti USA, LLC
145 Keystone Drive
Montgomeryville, PA 18936
Phone: 267-289-0020
Fax: 267-289-0023
<http://www.paletti-usa.com>

SIZE	DWG. NO.
A	2014-02-8076-301_REV-1
SCALE	1:5
Sheet 1 of 2	

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	SP4901N597	Track Profile 40x80/80 (Countersink Both Ends, Machined for Dowel Pins)	1
2	SL0184G596	Guide Shaft d16, 596 mm (Pinned)	2
3	SL0087N	Carriage 16/200/200/4/S	1
4	SL0164S	Wiper And Lubrication System 200	2
5	DK6325080354	Dowel Pin DIN 6325 - d8 x 35	2
6	SV2800V	T-Nut 5/16" ball-type, slide in	4
7	SZ0011S	Profile Cap 40x80	1



PROPRIETARY AND CONFIDENTIAL
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF PALETTI USA, LLC. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF PALETTI USA, LLC IS PROHIBITED.

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN MILLIMETERS
STANDARD TOLERANCES:
ANGULAR: ± 0.5 DEG
ONE PLACE DECIMAL: ± 0.1
TWO PLACE DECIMAL: ± 0.05

FINISH:
Saw Edge -A- // 0.1 A
Side -B- \perp 0.1 B ✓
 32

MATERIAL:

Revision # Reason: DRAWN

Reason: CHECKED

Description: Linear Guide 16-40x80/80

NAME DATE

tambrose 1/21/2015



Paletti USA, LLC
145 Keystone Drive
Montgomeryville, PA 18936
Phone: 267-289-0020
Fax: 267-289-0023
<http://www.paletti-usa.com>

SIZE DWG. NO.
A 2014-02-8076-301_REV-1

SCALE 1:4 Sheet 2 of 2

Location: \\S83200\\SharedFolder\\Sales\\Quotes\\2014 Quotes\\02-Feb 2014\\2014-02-8076_Kendall-Conveyor Concepts linear guides\\2014-02-8076-301_REV-1\\

P = 109CS-C
EA = B38
EB = B38
32848

STATION #
M-92004-01
PART #

1) 92B-EAB-BJA-DM-DDAP-1DM=1941

A & B = 3109 60 14

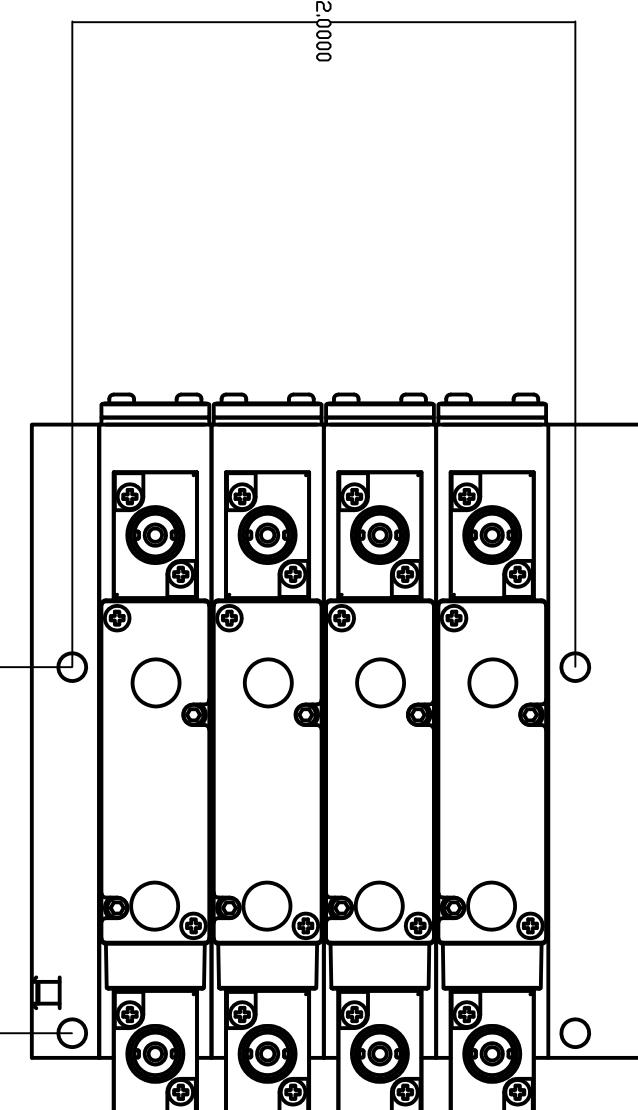
2) 92B-BAB-BJA-DM-DDAP-1DM=1941

A & B = 3175 56 14

3) 92B-BAB-BJA-DM-DDAP-1DM=1941

A & B = 3175 56 14

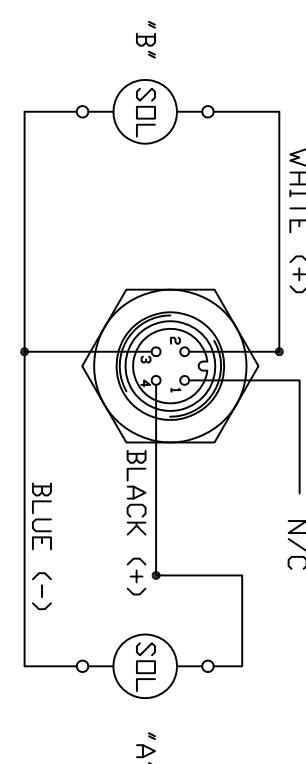
112.0000



P = 3108 60 18
EA = 109CS-C
EB = 109CS-C
32848

1
2
3
4

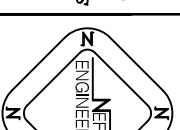
MOD 1941
M12 MALE 4 PIN
INSTALLED IN CONDUIT PLATE



• = CRIMP CONNECTORS

TITLE	92 Series 4 Station Manifold	NO.	DATE	REVISION	APP
CUSTOMER	Conveyor Concepts of Michigan	1			
JOB NO.	NP08-14-1136	ENGINEER	Chris Seigneur	2	
DATE	1-6-2014	SHEET	1 DIF 1	3	

ALL TECHNICAL ADVICE, RECOMMENDATIONS AND SERVICES ARE RENDERED BY THE SELLER FREE OF CHARGE THEY ARE BASED ON TECHNICAL DATA WHICH THE SELLER BELIEVES TO BE RELIABLE AND ARE INTENDED FOR USE BY SKILLED PERSONS AT THEIR OWN RISK. THE SELLER ASSUMES NO RESPONSIBILITY TO BUYER FOR RESULTS OBTAINED OR DAMAGES INCURRED FROM THEIR USE. SUCH RECOMMENDATIONS, TECHNICAL ADVICE OR SERVICES ARE NOT TO BE TAKEN AS A LICENSE TO OPERATE UNDER OR INTENDED TO SUGGEST INFRINGEMENT OF ANY EXISTING PATENT.



NEFF ENGINEERING CO., INC.
GRAND RAPIDS, MI.
616-554-1974

Individual mounting

Sub-base non "plug-in"	Sub-base "plug-in"
---------------------------	-----------------------

Series

33

34

36

32

37

38

52

67

69

44

46

42

47

48P

48

400

92

93

ISO 01

ISO 02

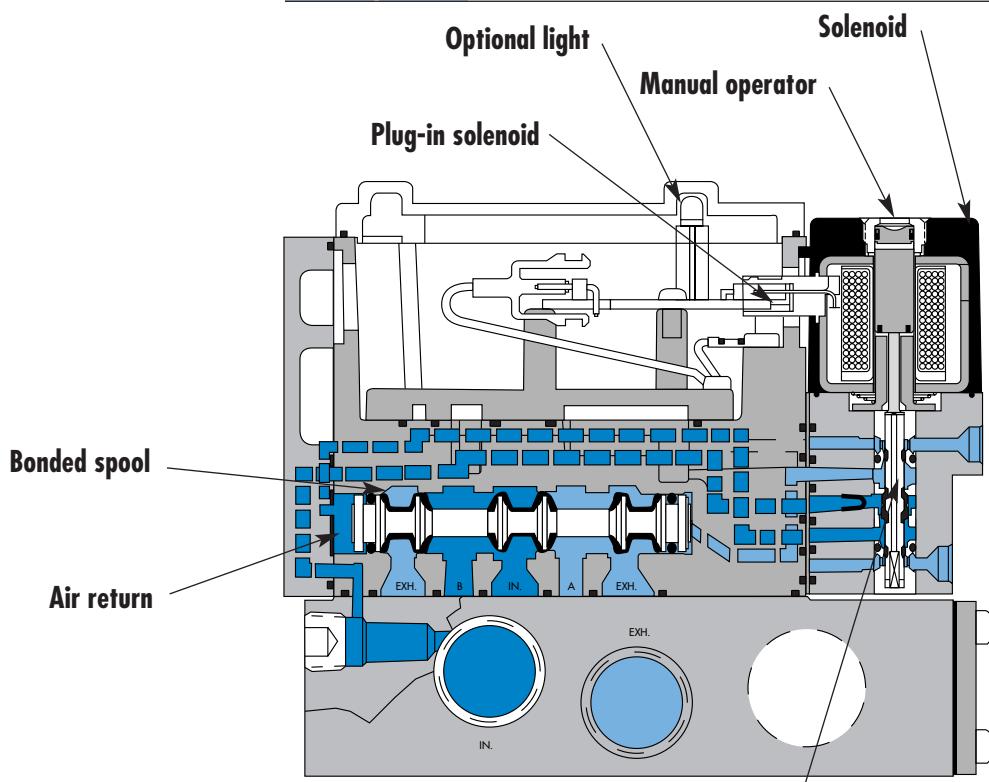
ISO 1

ISO 2

ISO 3

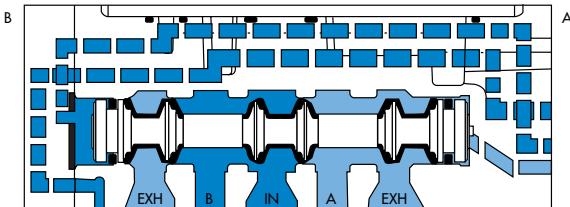
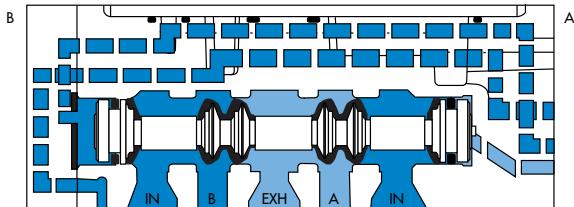
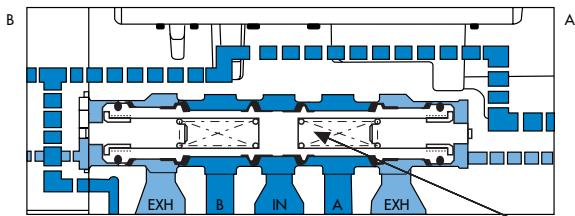
Manifold mounting

Sub-base non "plug-in"	Sub-base "plug-in"
---------------------------	-----------------------

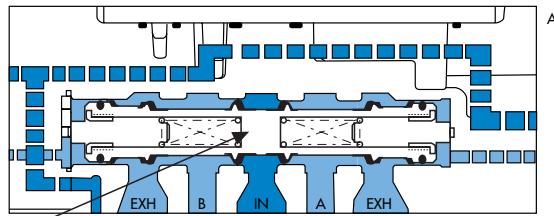


SERIES FEATURES

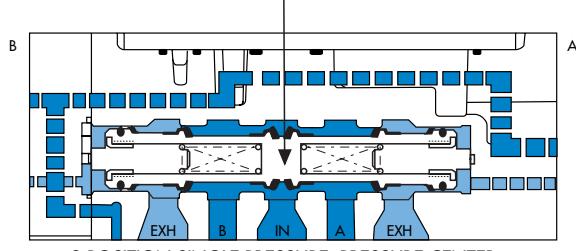
- Patented MACSOLENOID® for fastest possible response times and virtually burn-out proof AC solenoid operation.
- Optional low watt DC solenoids.
- Optional memory spring.
- Plug-in design of valves and bases for ease of maintenance.
- 2 position or 3 position valve configurations.

SPOOL CONFIGURATIONS

 2 POSITION SINGLE PRESSURE
 SHOWN WITH "B" OPERATOR ENERGIZED

 2 POSITION DUAL PRESSURE
 SHOWN WITH "B" OPERATOR ENERGIZED


3 POSITION CLOSED CENTER



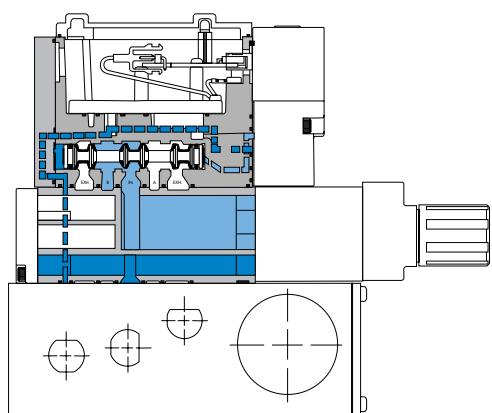
3 POSITION OPEN CENTER

SPRING CENTERING


3 POSITION SINGLE PRESSURE, PRESSURE CENTER

REGULATOR CONFIGURATIONS
SINGLE REGULATOR - SINGLE PRESSURE

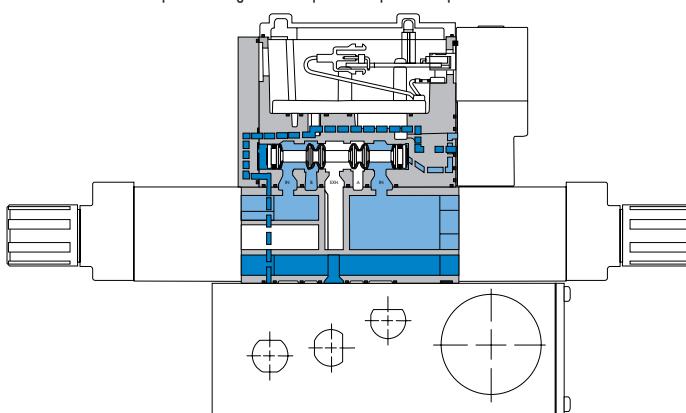
Pressure supplied to the individual or manifold base passes through the regulator. Regulated pressure is supplied to the pressure path of the valve.


MANIFOLD WITH REGULATOR - SINGLE PRESSURE

Note: For both single and dual pressure, air supply to the pilot system is never regulated.

DUAL REGULATOR - DUAL PRESSURE

Pressure supplied from each regulator is divided in the block. Regulated pressure from "A" regulator supplies cylinder port "A". Regulated pressure from "B" regulator supplies cylinder port "B". Dual pressure regulators require dual pressure spool in valve.


MANIFOLD WITH REGULATOR - DUAL PRESSURE

Consult "Precautions" page 327 before use, installation or service of MAC Valves..



Direct solenoid and solenoid pilot operated valves

Series 92

Function	Port size	Flow [Max]	Individual mounting	Series
5/2, 5/3	1/8" - 1/4" - 3/8"	1.2 Cv	Sub-base non "plug-in"	

OPERATIONAL BENEFITS

1. The 4-way pilot develops maximum shifting forces both ways.
2. Memory spring available.
3. Balanced spool, immune to variations of pressure, also provides high flow.
4. Short stroke with high flow.
5. Bonded seal spool with minimum friction, shifting in a glass-like finished bore.
6. Pilot with balanced poppet, high flow; short and consistent response times.



33
34
36
32
37
38
52
67
69
44
46
42
47
48P
48

HOW TO ORDER

SINGLE PRESSURE MODELS

Port size	Pilot air	5/2 Single operator	5/2 Double operator	5/3 Closed center	5/3 Open center	5/3 Pressure center
Valve less base		92B-ABA-000-DM-D XXX-XXX	92B-BBA-000-DM-D XXX-XXX	92B-EBA-000-DM-D XXX-XXX	92B-FBA-000-DM-D XXX-XXX	92B-GBA-000-DM-D XXX-XXX
1/8" NPTF		92B-ABA-AAG-DM-D XXX-XXX	92B-BBA-AAG-DM-D XXX-XXX	92B-EBA-AAG-DM-D XXX-XXX	92B-FBA-AAG-DM-D XXX-XXX	92B-GBA-AAG-DM-D XXX-XXX
1/4" NPTF	Internal	92B-ABA-BAG-DM-D XXX-XXX	92B-BBA-BAG-DM-D XXX-XXX	92B-EBA-BAG-DM-D XXX-XXX	92B-FBA-BAG-DM-D XXX-XXX	92B-GBA-BAG-DM-D XXX-XXX
3/8" NPTF		92B-ABA-CAG-DM-D XXX-XXX	92B-BBA-CAG-DM-D XXX-XXX	92B-EBA-CAG-DM-D XXX-XXX	92B-FBA-CAG-DM-D XXX-XXX	92B-GBA-CAG-DM-D XXX-XXX
1/8" NPTF		92B-ABA-AAH-DM-D XXX-XXX	92B-BBA-AAH-DM-D XXX-XXX	92B-EBA-AAH-DM-D XXX-XXX	92B-FBA-AAH-DM-D XXX-XXX	92B-GBA-AAH-DM-D XXX-XXX
1/4" NPTF	External	92B-ABA-BAH-DM-D XXX-XXX	92B-BBA-BAH-DM-D XXX-XXX	92B-EBA-BAH-DM-D XXX-XXX	92B-FBA-BAH-DM-D XXX-XXX	92B-GBA-BAH-DM-D XXX-XXX
3/8" NPTF		92B-ABA-CAH-DM-D XXX-XXX	92B-BBA-CAH-DM-D XXX-XXX	92B-EBA-CAH-DM-D XXX-XXX	92B-FBA-CAH-DM-D XXX-XXX	92B-GBA-CAH-DM-D XXX-XXX

DUAL PRESSURE MODELS (REQUIRE SANDWICH REGULATOR – SEE "REGULATORS" SECTION)

Port size	Pilot air	5/2 Single operator	5/2 Double operator
Valve less base		92B-CBA-000-DM-D XXX-XXX	92B-DBA-000-DM-D XXX-XXX
1/8" NPTF		92B-CBA-AAG-DM-D XXX-XXX	92B-DBA-AAG-DM-D XXX-XXX
1/4" NPTF	Internal	92B-CBA-BAG-DM-D XXX-XXX	92B-DBA-BAG-DM-D XXX-XXX
3/8" NPTF		92B-CBA-CAG-DM-D XXX-XXX	92B-DBA-CAG-DM-D XXX-XXX
1/8" NPTF		92B-CBA-AAH-DM-D XXX-XXX	92B-DBA-AAH-DM-D XXX-XXX
1/4" NPTF	External	92B-CBA-BAH-DM-D XXX-XXX	92B-DBA-BAH-DM-D XXX-XXX
3/8" NPTF		92B-CBA-CAH-DM-D XXX-XXX	92B-DBA-CAH-DM-D XXX-XXX

400
92
93
ISO 01
ISO 02
ISO 1
ISO 2
ISO 3

SOLENOID OPERATOR >

DM-D **XXX-XXX***

Above models are shown with side ports.

XX	Voltage	X	Wire length	X	Manual operator	XX	Electrical connection
JA	110 / 50, 120/60 (2.9W)	A	18" (Flying leads)	1	Non-locking recessed	BM	Flying leads
JB	220/50, 240/60 (2.9W)	B	24" (Flying leads)	2	Locking recessed	BN	Flying leads with diode
JC	24/60 (2.9W)	J	Connector			BP	Flying leads with M.O.V.
FB	24 VDC (1.8W)					BG	Flying leads with ground
DA	24 VDC (5.4W)					JB	Rectangular connector
DF	24 VDC (12.7W)					JD	Rectangular connector with light
						KA	Square connector

* Other options available, see page 309.

Other options available for the 92 series valves, see page 155.

TECHNICAL DATA

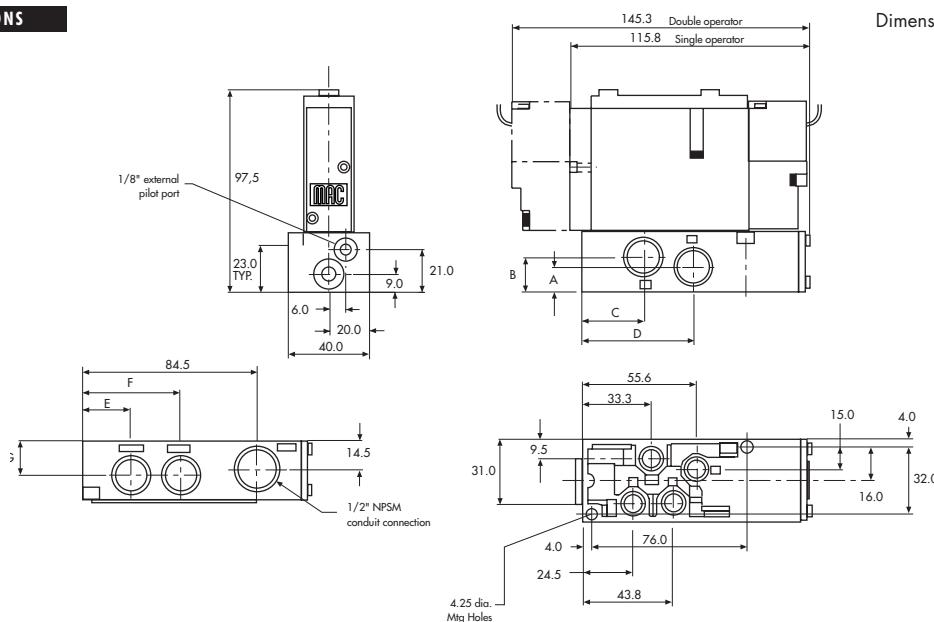
Fluid :	Compressed air, vacuum, inert gases		
Pressure range :	Internal pilot : 20 to 120 PSI	3 position : 35 to 120 PSI	
Lubrication :	External pilot : vacuum to 120 PSI	3 position : 35 to 120 PSI	
Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)			
Filtration :	40 µ		
Temperature range :	0°F to 120°F (-18°C to +50°C)		
Flow :	1/8": (1.0 Cv) - 1/4": (1.1 Cv) - 3/8": (1.2 Cv)		
Coil :	Class A continuous duty, #22 AWG x 18 lead wire		
Voltage range :	-15% to +10% of nominal voltage		
Protection :	Consult factory		
Power :	~Inrush 7.6 VA Holding : 4.8 VA = 1.8 to 12.7 W		
Response times :	24V=/5.4W 120/60	Energize : 8 ms Energize : 7-13 ms	De-energize : 7 ms De-energize : 12-20 ms

Options :

- BSPP threads • Sandwich flow control: FC92B-CA

Spare parts :

- Pilot valve DM-Dxxx-xxx • Valve blanking plate: M-92002
- Pressure seal between valve and base : 16543. • Mounting screws valve to base (X2) : 35050.

DIMENSIONS


Dimensions shown are metric (mm)

DIM.	A	B	C	D	E	F	G
1/8"	12.5	18.0	31.0	54.0	23.5	46.5	18.0
1/4"	12.5	18.0	31.0	54.0	23.5	46.5	18.0
3/8"	12.0	17.0	30.0	54.0	23.5	47.5	17.0



Direct solenoid and solenoid pilot operated valves

Series 92

Function	Port size	Flow [Max]	Individual mounting	Series
5/2, 5/3	1/8" - 1/4" - 3/8"	1.2 Cv	Sub-base "plug-in"	

OPERATIONAL BENEFITS

1. The 4-way pilot develops maximum shifting forces both ways.
2. Memory spring available.
3. Balanced spool, immune to variations of pressure, also provides high flow.
4. Short stroke with high flow.
5. Bonded seal spool with minimum friction, shifting in a glass-like finished bore.
6. Pilot with balanced poppet, high flow; short and consistent response times.



33
34
36
32
37
38
52
67
69
44
46
42
47
48P
48

HOW TO ORDER

SINGLE PRESSURE MODELS

Port size	Pilot air	5/2 Single operator	5/2 Double operator	5/3 Closed center	5/3 Open center	5/3 Pressure center
Valve less base		92B-AAA-000-DM-DxxP-XXX	92B-BAA-000-DM-DxxP-XXX	92B-EAA-000-DM-DxxP-XXX	92B-FAA-000-DM-DxxP-XXX	92B-GAA-000-DM-DxxP-XXX
1/8"		92B-AAA-AAA-DM-DxxP-XXX	92B-BAA-AAA-DM-DxxP-XXX	92B-EAA-AAA-DM-DxxP-XXX	92B-FAA-AAA-DM-DxxP-XXX	92B-GAA-AAA-DM-DxxP-XXX
1/4"	Internal	92B-AAA-BAA-DM-DxxP-XXX	92B-BAA-BAA-DM-DxxP-XXX	92B-EAA-BAA-DM-DxxP-XXX	92B-FAA-BAA-DM-DxxP-XXX	92B-GAA-BAA-DM-DxxP-XXX
3/8"		92B-AAA-CAA-DM-DxxP-XXX	92B-BAA-CAA-DM-DxxP-XXX	92B-EAA-CAA-DM-DxxP-XXX	92B-FAA-CAA-DM-DxxP-XXX	92B-GAA-CAA-DM-DxxP-XXX
1/8"		92B-AAA-AAD-DM-DxxP-XXX	92B-BAA-AAD-DM-DxxP-XXX	92B-EAA-AAD-DM-DxxP-XXX	92B-FAA-AAD-DM-DxxP-XXX	92B-GAA-AAD-DM-DxxP-XXX
1/4"	External	92B-AAA-BAD-DM-DxxP-XXX	92B-BAA-BAD-DM-DxxP-XXX	92B-EAA-BAD-DM-DxxP-XXX	92B-FAA-BAD-DM-DxxP-XXX	92B-GAA-BAD-DM-DxxP-XXX
3/8"		92B-AAA-CAD-DM-DxxP-XXX	92B-BAA-CAD-DM-DxxP-XXX	92B-EAA-CAD-DM-DxxP-XXX	92B-FAA-CAD-DM-DxxP-XXX	92B-GAA-CAD-DM-DxxP-XXX

DUAL PRESSURE MODELS (REQUIRE SANDWICH REGULATOR – SEE "REGULATORS" SECTION)

Port size	Pilot air	5/2 Single operator	5/2 Double operator
Valve less base		92B-CAA-000-DM-DxxP-XXX	92B-DAA-000-DM-DxxP-XXX
1/8"		92B-CAA-AAA-DM-DxxP-XXX	92B-DAA-AAA-DM-DxxP-XXX
1/4"	Internal	92B-CAA-BAA-DM-DxxP-XXX	92B-DAA-BAA-DM-DxxP-XXX
3/8"		92B-CAA-CAA-DM-DxxP-XXX	92B-DAA-CAA-DM-DxxP-XXX
1/8"		92B-CAA-AAD-DM-DxxP-XXX	92B-DAA-AAD-DM-DxxP-XXX
1/4"	External	92B-CAA-BAD-DM-DxxP-XXX	92B-DAA-BAD-DM-DxxP-XXX
3/8"		92B-CAA-CAD-DM-DxxP-XXX	92B-DAA-CAD-DM-DxxP-XXX

400
92
93
ISO 01
ISO 02
ISO 1
ISO 2
ISO 3

SOLENOID OPERATOR ➤

DM-D **XX P-XXX***

Above models are shown with side ports.

XX	Voltage	X	Manual operator	XX	Electrical connection
JA	110 /50, 120/60 (2.9W)	1	Non-locking recessed	DM	Plug-in
JB	220/50, 240/60 (2.9W)	2	Locking recessed	DN	Plug-in with diode
JC	24/60 (2.9W)			DP	Plug-in with M.O.V.
FB	24 VDC (1.8W)			DG	Plug-in with ground
DA	24 VDC (5.4W)			DJ	Plug-in with M.O.V. & ground
DF	24 VDC (12.7W)			DH	Plug-in with diode & ground

* Other options available, see page 309.

Note: Ground required for 30 Volts or higher.

Other options available for the 92 series valves, see page 156.

TECHNICAL DATA

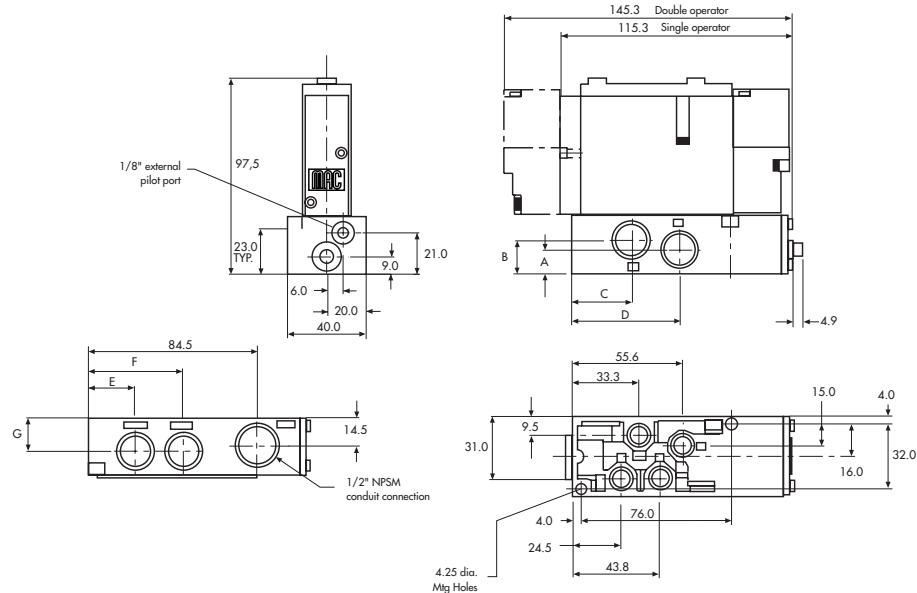
Fluid :	Compressed air, vacuum, inert gases		
Pressure range :	Internal pilot : 20 to 120 PSI	3 position : 35 to 120 PSI	
Lubrication :	External pilot : vacuum to 120 PSI	3 position : 35 to 120 PSI	
Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)			
Filtration :	40 µ		
Temperature range :	0°F to 120°F (-18°C to +50°C)		
Flow :	1/8": (1.0 Cv) - 1/4": (1.1 Cv) - 3/8": (1.2 Cv)		
Coil :	Class A continuous duty, #22 AWG x 18 lead wire		
Voltage range :	-15% to +10% of nominal voltage		
Protection :	Consult factory		
Power :	~Inrush 7.6 VA Holding : 4.8 VA = 1.8 to 12.7 W		
Response times :	24V=/5.4W	Energize : 8 ms	De-energize : 7 ms
	120/60	Energize : 7-13 ms	De-energize : 12-20 ms

Options :

- BSPP threads
- Sandwich flow control: FC92B-AA (sgl. operator), FC92B-BA (dbl. operator)

Spare parts :

- Pilot valve DM-DxxP-xxx
- Valve blanking plate: M-92002
- Pressure seal between valve and base : 16543.
- Mounting screws valve to base (X2) : 35050.

DIMENSIONS




Direct solenoid and solenoid pilot operated valves

Series 92

Function	Port size	Flow [Max]	Manifold mounting	Series
5/2, 5/3	1/4" - 3/8"	1.2 Cv	Sub-base non "plug-in"	

OPERATIONAL BENEFITS

1. The 4-way pilot develops maximum shifting forces both ways.
2. Memory spring available.
3. Balanced spool, immune to variations of pressure, also provides high flow.
4. Short stroke with high flow.
5. Bonded seal spool with minimum friction, shifting in a glass-like finished bore.
6. Pilot with balanced poppet, high flow; short and consistent response times.
7. Wiping effect eliminates sticking.
8. Long service life.



33
34
36
32
37
38
52
67
69
44
46
42
47
48P
48
400
92
93
ISO 01
ISO 02
ISO 1
ISO 2
ISO 3

HOW TO ORDER

SINGLE PRESSURE MODELS

Port size	Pilot air	5/2 Single operator	5/2 Double operator	5/3 Closed center	5/3 Open center	5/3 Pressure center
Valve less base		92B-ABA-000-DM-DXXX-XXX	92B-BBA-000-DM-DXXX-XXX	92B-EBA-000-DM-DXXX-XXX	92B-FBA-000-DM-DXXX-XXX	92B-GBA-000-DM-DXXX-XXX
1/4" NPTF	Internal	92B-ABA-BJG-DM-DXXX-XXX	92B-BBA-BJG-DM-DXXX-XXX	92B-EBA-BJG-DM-DXXX-XXX	92B-FBA-BJG-DM-DXXX-XXX	92B-GBA-BJG-DM-DXXX-XXX
3/8" NPTF		92B-ABA-CJG-DM-DXXX-XXX	92B-BBA-CJG-DM-DXXX-XXX	92B-EBA-CJG-DM-DXXX-XXX	92B-FBA-CJG-DM-DXXX-XXX	92B-GBA-CJG-DM-DXXX-XXX

DUAL PRESSURE MODELS (REQUIRE SANDWICH REGULATOR – SEE "REGULATORS" SECTION)

Port size	Pilot air	5/2 Single operator	5/2 Double operator
Valve less base		92B-CBA-000-DM-DXXX-XXX	92B-DBA-000-DM-DXXX-XXX
1/4" NPTF	Internal	92B-CBA-BJG-DM-DXXX-XXX	92B-DBA-BJG-DM-DXXX-XXX
3/8" NPTF		92B-CBA-CJG-DM-DXXX-XXX	92B-DBA-CJG-DM-DXXX-XXX

Above models are shown with side ports.

SOLENOID OPERATOR ➤

DM-D **XXX-XXX***

XX	Voltage	X	Wire length	X	Manual operator	XX	Electrical connection
JA	110 /50, 120/60 (2.9W)	A	18" (flying leads)	1	Non-locking recessed	KA	Square connector
JB	220/50, 240/60 (2.9W)	J	Connector	2	Locking recessed	KD	Square connector with light
JC	24/60 (2.9W)					JB	Rectangular connector
FB	24 VDC (1.8W)					JD	Rect. connector with light
DA	24 VDC (5.4W)					BA	Flying leads
DF	24 VDC (12.7W)					BK	Flying leads with diode

* Other options available, see page 309.
End plate kit required (port size 3/8"): M-92004-01-01 (internal pilot)
M-92004-02-01 (External pilot)

Other options available for the 92 series valves, see page 155.

TECHNICAL DATA

Fluid :	Compressed air, vacuum, inert gases		
Pressure range :	Internal pilot : 20 to 120 PSI	3 position : 35 to 120 PSI	
Lubrication :	External pilot : vacuum to 120 PSI	3 position : 35 to 120 PSI	
Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)			
Filtration :	40 µ		
Temperature range :	0°F to 120°F (-18°C to +50°C)		
Flow :	1/4": (1.1 Cv) - 3/8": (1.2 Cv)		
Coil :	Class A continuous duty, #22 AWG x 18 leads		
Voltage range :	-15% to +10% of nominal voltage		
Protection :	Consult factory		
Power :	~Inrush 7.6 VA Holding : 4.8 VA = 1.8 to 12.7 W		
Response times :	24V=/5.4W	Energize : 8 ms	De-energize : 7 ms
	120/60	Energize : 7-13 ms	De-energize : 12-20 ms

Options :

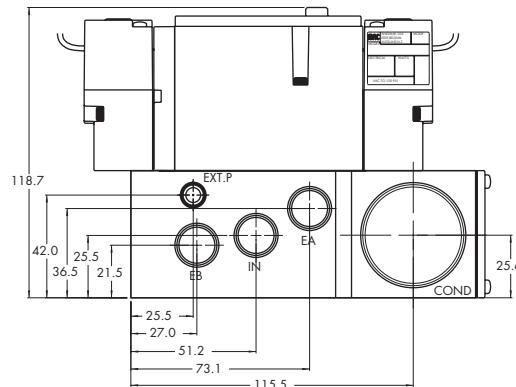
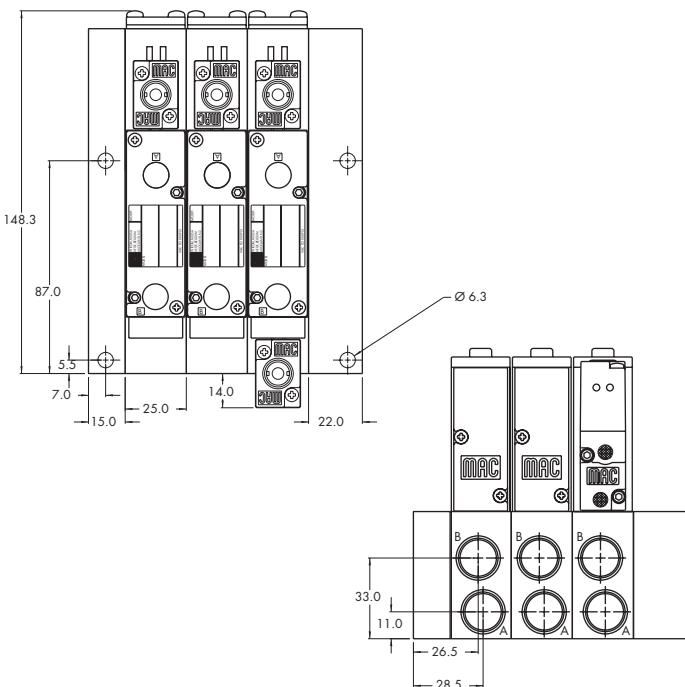
- BSPP threads • Sandwich flow controls: FC92B-CA

Spare parts :

- Pilot valve: DM-Dxxx-xxx • Valve blanking plate: M-92002 • Pressure seal, valve to base 16543
- Inlet/Exhaust isolator disc: N-92018.

DIMENSIONS

Dimensions shown are metric (mm)





Direct solenoid and solenoid pilot operated valves

Series 92

Function	Port size	Flow [Max]	Manifold mounting	Series
5/2, 5/3	1/4" - 3/8"	1.2 Cv	Sub-base "plug-in"	

OPERATIONAL BENEFITS

1. The 4-way pilot develops maximum shifting forces both ways.
2. Memory spring available.
3. Balanced spool, immune to variations of pressure, also provides high flow.
4. Short stroke with high flow.
5. Bonded seal spool with minimum friction, shifting in a glass-like finished bore.
6. Pilot with balanced poppet, high flow; short and consistent response times.
7. Wiping effect eliminates sticking.
8. Long service life.



33

34

36

32

37

38

52

67

69

44

46

42

47

48P

48

400

92

93

ISO 01

ISO 02

ISO 1

ISO 2

ISO 3

HOW TO ORDER

SINGLE PRESSURE MODELS

Port size	Pilot air	5/2 Single operator	5/2 Double operator	5/3 Closed center	5/3 Open center	5/3 Pressure center
Valve less base		92B-AAA-000-DM-DxxP-XXX	92B-BAA-000-DM-DxxP-XXX	92B-EAA-000-DM-DxxP-XXX	92B-FAA-000-DM-DxxP-XXX	92B-GAA-000-DM-DxxP-XXX
1/4" NPTF	Internal	92B-AAA-BJA-DM-DxxP-XXX	92B-BAA-BJA-DM-DxxP-XXX	92B-EAA-BJA-DM-DxxP-XXX	92B-FAA-BJA-DM-DxxP-XXX	92B-GAA-BJA-DM-DxxP-XXX
3/8" NPTF		92B-AAA-CJA-DM-DxxP-XXX	92B-BAA-CJA-DM-DxxP-XXX	92B-EAA-CJA-DM-DxxP-XXX	92B-FAA-CJA-DM-DxxP-XXX	92B-GAA-CJA-DM-DxxP-XXX

DUAL PRESSURE MODELS (REQUIRE SANDWICH REGULATOR – SEE "REGULATORS" SECTION)

Port size	Pilot air	5/2 Single operator	5/2 Double operator
Valve less base		92B-CAA-000-DM-DxxP-XXX	92B-DAA-000-DM-DxxP-XXX
1/4" NPTF	Internal	92B-CAA-BJA-DM-DxxP-XXX	92B-DAA-BJA-DM-DxxP-XXX
3/8" NPTF		92B-CAA-CJA-DM-DxxP-XXX	92B-DAA-CJA-DM-DxxP-XXX

SOLENOID OPERATOR ►

DM-D **XX P-XXX***

Above models are shown with side ports and no lights.

XX	Voltage	X	Manual operator	XX	Electrical connection
JA	110 /50, 120/60 (2.9W)	1	Non-locking recessed	DM	Plug-in
JB	220/50, 240/60 (2.9W)	2	Locking recessed	DN	Plug-in with diode
JC	24/60 (2.9W)			DP	Plug-in with M.O.V.
FB	24 VDC (1.8W)			DG	Plug-in with ground
DA	24 VDC (5.4W)			DJ	Plug-in with M.O.V. & ground
DF	24 VDC (12.7W)			DH	Plug-in with diode & ground

* Other options available, see page 309.

Note: Ground required for 30 Volts or higher.

End plate kit required (port size 3/8"): M-92004-01-01 (internal pilot)

M-92004-02-01 (external pilot)

Other options available for the 92 series valves, see page 156.

TECHNICAL DATA

Fluid :	Compressed air, vacuum, inert gases		
Pressure range :	Internal pilot : 20 to 120 PSI	3 position : 35 to 120 PSI	
Lubrication :	External pilot : vacuum to 120 PSI	3 position : 35 to 120 PSI	
Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)			
Filtration :	40 µ		
Temperature range :	0°F to 120°F (-18°C to +50°C)		
Flow :	1/4": (1.1 Cv) - 3/8": (1.2 Cv)		
Coil :	Class A continuous duty, #22 AWG x 12 base leads		
Voltage range :	-15% to +10% of nominal voltage		
Protection :	Consult factory		
Power :	~Inrush 7.6 VA Holding : 4.8 VA = 1.8 to 12.7 W		
Response times :	24V=/5.4W	Energize : 8 ms	De-energize : 7 ms
	120/60	Energize : 7-13 ms	De-energize : 12-20 ms

Options :

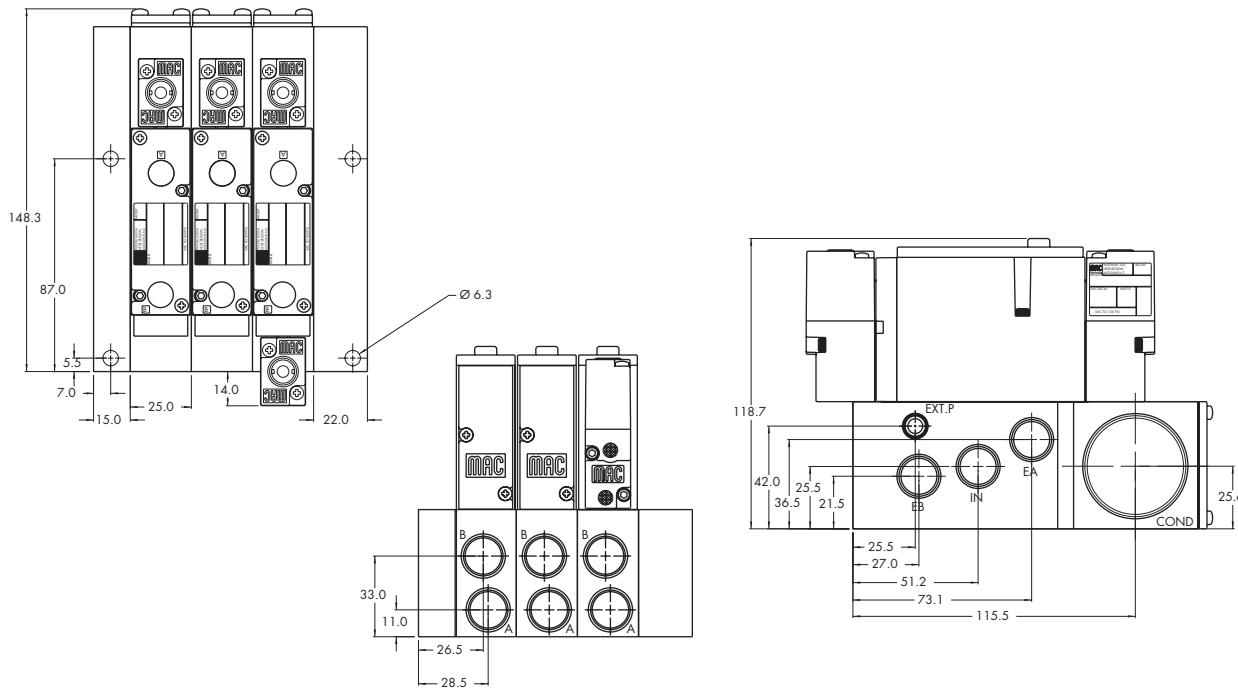
- BSPP threads • Sandwich flow controls: FC92B-AA (sgl. operator), FC92B-BA (dbl. operator)

Spare parts :

- Pilot valve: DM-DxxP-xxx • Valve blanking plate: M-92002 • Pressure seal, valve to base: 16543
- Mounting screws valve to base (x2): 35050 • Inlet/Exhaust isolator disc: N-92018.

DIMENSIONS

Dimensions shown are metric (mm)





Direct solenoid and solenoid pilot operated valves

OPTIONS FOR NON PLUG-IN VALVES	33
Valve function	34
92B-HXX-XXX-XX-D XXX-XXX	36
<ul style="list-style-type: none"> H for 3 position dual pressure, pressure center* J for 3 position dual pressure, closed center* K for 3 position dual pressure, open center* L for single operator, single pressure with memory spring N for single operator, dual pressure with memory spring* 	
Pilot exhaust	37
92B-XBX-XXX-XX-D XXX-XXX	38
<ul style="list-style-type: none"> B standard pilot exhaust D pilot exhaust to main valve exhaust** 	
Port configuration :	39
Individual sub-base	40
92B-XXX-XAX-XX-D XXX-XXX	41
<ul style="list-style-type: none"> A side ports B bottom ports (1/8" only) C side & bottom ports (1/8" only) D side inlet & exhaust with bottom cylinder ports (1/8") 	
Manifold sub-base	42
92B-XXX-XJX-XX-D XXX-XXX	43
<ul style="list-style-type: none"> J side ports K bottom ports 	
Pilot style :	44
92B-XXX-XXX-DM-D XXX-XXX	45
<ul style="list-style-type: none"> DM pilot exhaust muffled DP pilot exhaust piped (#10-32) DU pilot exhaust to main exhaust 	
Base only :	46
92B-000-XXX (i.e. 92B-000-AAG)	- Individual base
92B-000-XXX (i.e. 92B-000-BJG)	- Manifold base
	47
	48P
	48
	49
	50
	51
	52
	53
	54
	55
	56
	57
	58
	59
	60
	61
	62
	63
	64
	65
	66
	67
	68
	69
	70
	71
	72
	73
	74
	75
	76
	77
	78
	79
	80
	81
	82
	83
	84
	85
	86
	87
	88
	89
	90
	91
	92
	93
	94
	95
	96
	97
	98
	99
	100
	101
	102
	103
	104
	105
	106
	107
	108
	109
	110
	111
	112
	113
	114
	115
	116
	117
	118
	119
	120
	121
	122
	123
	124
	125
	126
	127
	128
	129
	130
	131
	132
	133
	134
	135
	136
	137
	138
	139
	140
	141
	142
	143
	144
	145
	146
	147
	148
	149
	150
	151
	152
	153
	154
	155
	156
	157
	158
	159
	160
	161
	162
	163
	164
	165
	166
	167
	168
	169
	170
	171
	172
	173
	174
	175
	176
	177
	178
	179
	180
	181
	182
	183
	184
	185
	186
	187
	188
	189
	190
	191
	192
	193
	194
	195
	196
	197
	198
	199
	200
	201
	202
	203
	204
	205
	206
	207
	208
	209
	210
	211
	212
	213
	214
	215
	216
	217
	218
	219
	220
	221
	222
	223
	224
	225
	226
	227
	228
	229
	230
	231
	232
	233
	234
	235
	236
	237
	238
	239
	240
	241
	242
	243
	244
	245
	246
	247
	248
	249
	250
	251
	252
	253
	254
	255
	256
	257
	258
	259
	260
	261
	262
	263
	264
	265
	266
	267
	268
	269
	270
	271
	272
	273
	274
	275
	276
	277
	278
	279
	280
	281
	282
	283
	284
	285
	286
	287
	288
	289
	290
	291
	292
	293
	294
	295
	296
	297
	298
	299
	300
	301
	302
	303
	304
	305
	306
	307
	308
	309
	310
	311
	312
	313
	314
	315
	316
	317
	318
	319
	320
	321
	322
	323
	324
	325
	326
	327
	328
	329
	330
	331
	332
	333
	334
	335
	336
	337
	338
	339
	340
	341
	342
	343
	344
	345
	346
	347
	348
	349
	350
	351
	352
	353
	354
	355
	356
	357
	358
	359
	360
	361
	362
	363
	364
	365
	366
	367
	368
	369
	370
	371
	372
	373
	374
	375
	376
	377
	378
	379
	380
	381
	382
	383
	384
	385
	386
	387
	388
	389
	390
	391
	392
	393
	394
	395
	396
	397
	398
	399
	400
	401
	402
	403
	404
	405
	406
	407
	408
	409
	410
	411
	412
	413
	414
	415
	416
	417
	418
	419



Direct solenoid and solenoid pilot operated valves

OPTIONS FOR PLUG-IN VALVES

Valve function

92B-HXX-XXX-XX-DxxP-XXX

- H** for 3 position dual pressure, pressure center*
- J** for 3 position dual pressure, closed center*
- K** for 3 position dual pressure, open center*
- L** for single operator, single pressure with memory spring
- N** for single operator, dual pressure with memory spring*

Pilot exhaust

92B-XAX-XXX-XX-DxxP-XXX

- A** standard pilot exhaust
- C** pilot exhaust to main valve exhaust**

Body electrical

92B-XXA-XXX-XX-DxxP-XXX

- A** no light
- B** light(s)
- F** suppression and blocking diode with light(s)
- H** M.O.V. with light(s)

Port configuration :

Individual sub-base

92B-XXX-XAX-XX-DxxP-XXX

- A** side ports
- B** bottom ports (1/8" only)
- C** side & bottom ports (1/8" only)
- D** side inlet & exhaust with bottom cylinder ports (1/8")

Individual & Manifold sub-base Int. pilot

92B-XXX-XXA-XX-DxxP-XXX

- A** internal pilot no light
- B** internal pilot single light
- C** internal pilot double light

Manifold sub-base

92B-XXX-XJX-XX-DxxP-XXX

- J** side ports
- K** bottom ports

Individual sub-base Ext. pilot

92B-XXX-XXD-XX-DxxP-XXX

- D** external pilot no light
- E** external pilot single light
- F** external pilot double light

Pilot style :

92B-XXX-XXX-DM-DxxP-XXX

- DM** pilot exhaust muffled
- DP** pilot exhaust piped (#10-32)
- DU** pilot exhaust to main exhaust

Lead Wire Lengths : (manifold sub-base only)

92B-XXX-XXX-DM-DxxP-XXX

- P** 12" leads
- I** 18" leads
- 2** 24" leads
- 3** 36" leads
- 4** 48" leads
- 5** 72" leads

Base only :

92B-000-XXX (i.e. 92B-000-AAA) - Individual base

(Note: bases are wired for double solenoid valves)

92B-000-XXX (i.e. 92B-000-BJA) - Manifold base

* Requires sandwich regulator.

** Must use DU pilot. Main valve exhaust cannot be restricted.

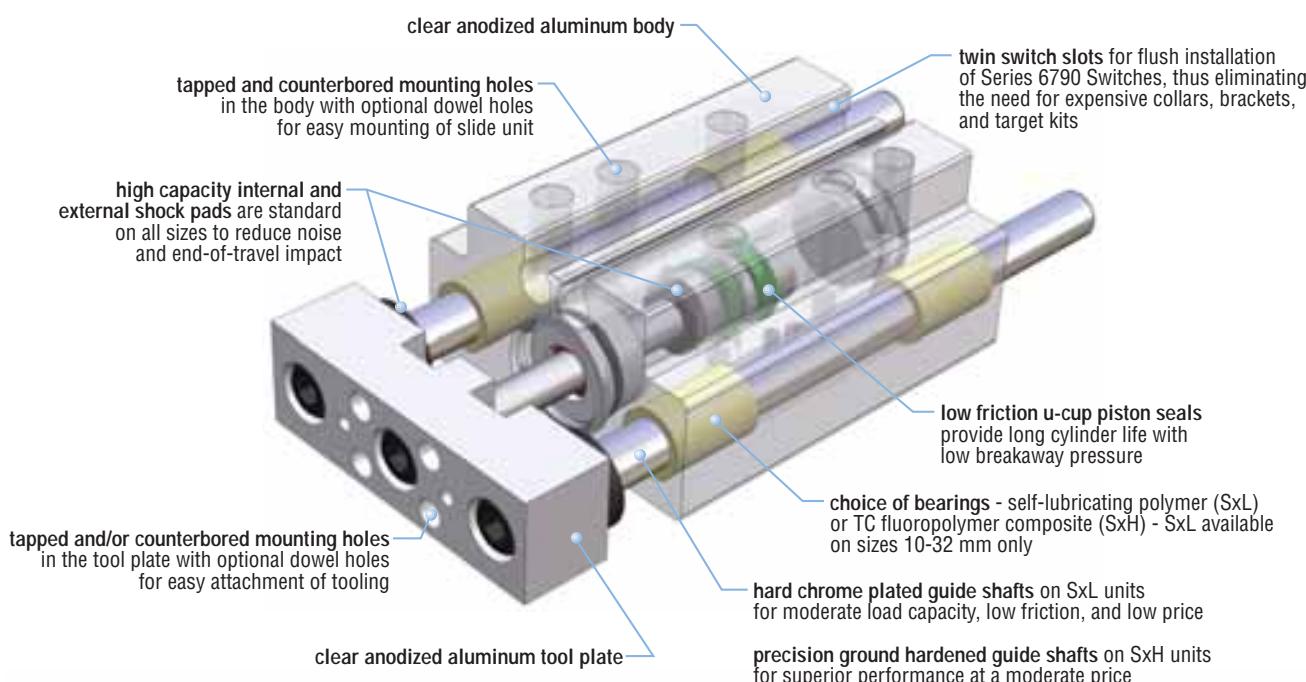
SxL, SxH



HIGH LOAD CAPABILITY COMPACT SLIDE



SxL, SxH



Major Benefits

- Choose from two bearing types (2 bearings per shaft, 4 total)
 - Nine bore sizes
 - No metal to metal contact
 - Completely corrosion resistant options provide protection in harsh environments
 - All units incorporate twin switch slots for flush switch mounting
 - Ships next day

Industry Uses

- Material handling – conveyor
 - Assembly machine builders
 - Labeling equipment
 - Bearing manufacturers
 - Automotive
 - Semiconductor
 - Optical

ORDER/ING DATA: SERIES SxL/SxH SLIDES

TO ORDER SPECIFY:
Product, Series, Type, Design
No., Bore Size, Travel, and
Miscellaneous Options.

TO ORDER SPECIFY:
Product, Series, Type, Design
No., Bore Size, Travel, and
Miscellaneous Options.

PRODUCT	TYPE	BORE SIZE	MAGNET	DOWEL HOLES
S - Slide	L - Polymer bushing (see note 1) H - Heavy duty precision TC composite bushing	(mm) 08 10 14 20 25 32 40 50 63	M- Magnetic piston for PHD Series 6790 Switches	(see availability table below) J3 - Transitional fit J4 - Clearance fit (imperial only) J8 - Precision fit (metric only)

PRODUCT CODE: S A L 1 10 x 1/2 - Z1 - AE - M - J3

SERIES
A - Threaded tool plate
B - Counterbore holes in tool plate

DESIGN NO.
1 - Imperial - ports and mounting holes are imperial
5 - Metric - ports and mounting holes are metric

TRAVEL'(see note 4)

UNIT & BORE SIZE	IMPERIAL (in)	METRIC (mm)		
SAL/SBL 10 14 20, 25, 32	STANDARD 1/2, 1, 1-1/2 1/2, 1, 1-1/2 1, 2, 3	STANDARD 12, 25, 40 12, 25, 40 25, 50, 75		
SAH/SBH 08 10 14 20, 25, 32 40, 50, 63	STANDARD 1/2, 1, 1-1/2 1/2, 1, 1-1/2 1/2, 1, 1-1/2 1, 2, 3 1, 2, 3	LONG - 2, 3, 4 2, 3, 4, 5, 6 4, 5, 6, 7, 8 4, 5, 6, 7, 8	STANDARD 12, 25, 40 12, 25, 40 12, 25, 40 25, 50, 75 50, 75	LONG - - - - 100

TRAVEL ADJUSTMENT
AE - Extend travel adjustment

SERIES 6790 PROXIMITY SWITCHES

NO.	DESCRIPTION
-02	NPN (Sink) or PNP (Source) DC Reed, 2 m cable
-05	NPN (Sink) or PNP (Source) DC Reed, 5 m cable
-02	NPN (Sink) DC Solid State, 2 m cable
-05	NPN (Sink) DC Solid State, 5 m cable
-02	PNP (Source) DC Solid State, 2 m cable
-05	PNP (Source) DC Solid State, 5 m cable

NOTES:

- 1 - Imperial - ports and mounting holes are imperial
- 5 - Metric - ports and mounting holes are metric
- Standard travel is 1, 2, 3 inches (25, 50, 75 mm).
- Long travel is 1/2, 1, 1-1/2 inches (12, 25, 40 mm).
- Extended travel is 2, 3, 4, 5, 6, 7, 8 inches (50, 75 mm).
- For metric travel, standard is 1, 2, 3 mm and long is 4, 5, 6, 7, 8 mm.
- For metric travel, extended is 100 mm.
- For metric travel, standard is 1, 2, 3 mm and long is 4, 5, 6, 7, 8 mm.
- For metric travel, extended is 100 mm.

DOWEL HOLE AVAILABILITY

PART NO.	DESCRIPTION
67902-1-02	NPN (Sink) or PNP (Source) DC Reed, 2 m cable
67902-1-05	NPN (Sink) or PNP (Source) DC Reed, 5 m cable
67903-1-02	NPN (Sink) DC Solid State, 2 m cable
67903-1-05	NPN (Sink) DC Solid State, 5 m cable
67904-1-02	PNP (Source) DC Solid State, 2 m cable
67904-1-05	PNP (Source) DC Solid State, 5 m cable
67922-1	NPN (Sink) or PNP (Source) DC Reed, Quick Connect
67929-2	AC Reed, Current Limited, Quick Connect
67923-1	NPN (Sink) DC Solid State, Quick Connect
67924-1	PNP (Source) DC Solid State, Quick Connect
63549-02	2 m Cordset with Quick Connect
63549-05	5 m Cordset with Quick Connect



UNIQUE SLIDES ARE
AVAILABLE. PLEASE
CONSULT PHD.

NOTES

- 1) L - Polymer bushing not available on size 08, 40, 50, & 63 mm bore units.
 - 2) Shock pads are standard on extend and retract for all sizes. Retract shock pads are located on the guide shafts. Extend shock pad is located internally on the piston.
 - 3) -AE option (stop collars) is recommended for high cycle speed applications and high load applications. Extend shock pads are included with the -AE option to remove impact load from the piston rod.
 - 4) ** Long travel units are available standard on imperial units. 100 mm long travel units are available on metric sizes 40, 50, & 63. Contact PHD for longer travel metric units.

DOWEL HOLE AVAILABILITY					
DESIGN NO.	ITEM	DOWEL HOLES			
		J3	J4	J8	
1 (IMPERIAL)	HOUSING	(J3 STD)	STD	OPT	-
	SAx TOOL PLATE	NONE	OPT	OPT	-
	SBx TOOL PLATE	(J3 STD)	STD	OPT	-
2 (METRIC)	HOUSING	PD	OPT	-	OPT
	SAx TOOL PLATE	PD	OPT	-	OPT
	SBx TOOL PLATE	PD	OPT	-	OPT

NOTES:

- 1) SEE DOWEL HOLE DIAMETERS TABLE FOR DIMENSIONAL INFORMATION.
2) STD = Standard OPT = Optional PD = Production Diameter

ENGINEERING DATA: SERIES SxL/SxH SLIDES

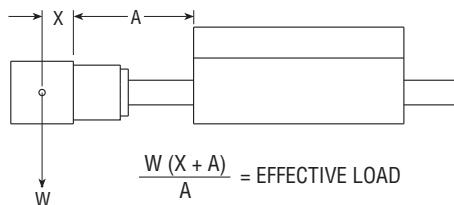
SPECIFICATIONS		SERIES SxL / SxH						CYLINDER FORCE CALCULATIONS					
		30 to 150 psi [2 to 10 bar] -20° to 180°F [-29° to 82°C]						IMPERIAL $F = P \times A$			METRIC $F = 0.1 \times P \times A$		
		Nominal travel +.080/-0.000 [+2 mm/-0 mm] Factory lubricated for rated life Field repairable						F = Cylinder Force P = Operating Pressure A = Effective Area			lbs psi in²		
SIZE	TRAVEL in mm	SHAFT DIAMETER in mm	BORE DIAMETER in mm	EFFECTIVE AREA DIRECTION			BASE WEIGHT lb kg	MAX. STATIC LOAD		TYPICAL DYNAMIC LOAD			
08	1/2 12	.197 5	.315 8	EXTEND	.078	50.3	.24 .11	SxL		46 205	0 - 1	0 - 4.5	
	1 25				.058	37.4	.29 .13	SxH		33 147			
	1 1/2 40			RETRACT			.34 .15	SxL		26 116			
10	1/2 12	.236 6	.394 10	EXTEND	.122	78.7	.28 .13	60 267	82 365	1 - 2	4.5 - 8.9		
	1 25				.091	58.7	.36 .16	44 196	59 262				
	1 1/2 40			RETRACT			.44 .20	34 151	46 205				
	2 —						.52 —	— —	37 —				
	3 —						.68 —	— —	27 —				
14	4 —	.394 10	.551 14	EXTEND	.238	154	.79 .36	210 934	344 1530	2 - 6	8.9 - 26.7		
	5 —				.195	126	.95 .43	190 845	254 1130				
	6 —			RETRACT			1.11 .50	150 667	202 898				
	7 —						1.27 —	— —	165 —				
	8 —						1.59 —	— —	123 —				
	9 —						1.91 —	— —	98 —				
	10 —						2.23 —	— —	81 —				
	11 —						2.55 —	— —	69 —				
20	1 25	.472 12	.787 20	EXTEND	.487	314	1.72 .78	280 1245	378 1681	6 - 12	26.7 - 53.4		
	2 50				.409	264	2.26 1.03	190 845	260 1156				
	3 75			RETRACT			2.80 1.27	150 667	198 881				
	4 —						3.34 —	— —	158 —				
	5 —						3.88 —	— —	133 —				
	6 —						4.42 —	— —	114 —				
	7 —						4.96 —	— —	100 —				
	8 —						5.50 —	— —	89 —				
25	1 25	.630 16	.984 25	EXTEND	.761	491	2.79 1.27	423 1882	738 3284	10 - 16	44.5 - 71.2		
	2 50				.639	412	3.62 1.64	419 1865	489 2176				
	3 75			RETRACT			4.45 2.02	323 1437	380 1691				
	4 —						5.27 —	— —	312 —				
	5 —						6.10 —	— —	264 —				
	6 —						6.92 —	— —	229 —				
	7 —						7.75 —	— —	202 —				
	8 —						8.58 —	— —	180 —				
32	1 25	.787 20	1.260 32	EXTEND	1.247	805	3.89 1.76	528 2349	1325 5894	12 - 25	53.4 - 111		
	2 50				1.071	691	4.97 2.25	523 2326	950 4226				
	3 75			RETRACT			6.05 2.74	520 2313	750 3336				
	4 —						7.13 —	— —	605 —				
	5 —						8.21 —	— —	515 —				
	6 —						9.24 —	— —	445 —				
	7 —						10.32 —	— —	393 —				
	8 —						11.40 —	— —	352 —				
40	1 —	.984 25	1.575 40	EXTEND	1.948	1256.8	6.86 —	— —	1947 —	16 - 75	71 - 334		
	2 50				1.636	1055.5	8.57 3.86	— —	1740 7740				
	3 75			RETRACT			10.28 4.64	— —	1374 6112				
	4 100						11.99 5.41	— —	1136 5053				
	5 —						13.70 —	— —	968 —				
	6 —						15.41 —	— —	843 —				
	7 —						17.12 —	— —	747 —				
	8 —						18.83 —	— —	671 —				
50	1 —	1.181 30	1.969 50	EXTEND	3.043	1963.2	10.94 —	— —	2888 —	25 - 100	111 - 445		
	2 50				2.556	1649.0	13.43 6.08	— —	2859 12717				
	3 75			RETRACT			15.92 7.21	— —	2282 10151				
	4 100						18.41 8.34	— —	1899 8447				
	5 —						20.90 —	— —	1626 —				
	6 —						23.39 —	— —	1422 —				
	7 —						25.88 —	— —	1263 —				
	8 —						28.37 —	— —	1137 —				
63	1 —	1.374 34.9	2.480 63	EXTEND	4.832	3117.4	17.26 —	— —	3823 —	75 - 150	334 - 668		
	2 50				4.345	2803.2	20.64 9.34	— —	3805 16925				
	3 75			RETRACT			24.03 10.87	— —	3555 15813				
	4 100						27.41 12.41	— —	2964 13185				
	5 —						30.79 —	— —	2542 —				
	6 —						34.18 —	— —	2225 —				
	7 —						37.56 —	— —	1978 —				
	8 —						40.94 —	— —	1781 —				

SxL, SxH

ENGINEERING DATA: SERIES SxL/SxH SLIDES

EFFECTIVE LOAD

All of the loads in this catalog are given at the front of the extended tool plate. When the load is attached to the tool plate, use the following formula and chart to calculate the effective load. This method of finding the effective load must be used for all the load carrying specifications and charts in this catalog.



SxL, SxH

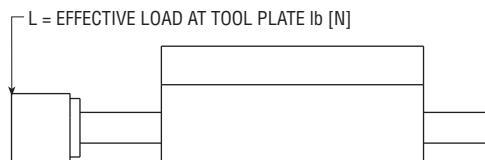
SIZE	TRAVEL		A	
	in	mm	in	mm
08	1/2	12	.937	23.8
	1	25	1.437	36.5
	1-1/2	40	1.937	49.2
10	1/2	12	.937	23.8
	1	25	1.437	36.5
	1-1/2	40	1.937	49.2
	2	—	2.437	—
	3	—	3.437	—
	4	—	4.437	—
14	1/2	12	1.062	27.0
	1	25	1.562	39.7
	1-1/2	40	2.062	52.4
	2	—	2.562	—
	3	—	3.562	—
	4	—	4.562	—
	5	—	5.562	—
	6	—	6.562	—

SIZE	TRAVEL		A	
	in	mm	in	mm
20	1	25	1.875	47.6
	2	50	2.875	73.0
	3	75	3.875	98.4
	4	—	4.875	—
	5	—	5.875	—
	6	—	6.875	—
	7	—	7.875	—
	8	—	8.875	—
25	1	25	2.074	52.7
	2	50	3.074	78.1
	3	75	4.074	103.5
	4	—	5.074	—
	5	—	6.074	—
	6	—	7.074	—
	7	—	8.074	—
	8	—	9.074	—
32	1	25	2.188	55.6
	2	50	3.188	81.0
	3	75	4.188	106.4
	4	—	5.188	—
	5	—	6.188	—
	6	—	7.188	—
	7	—	8.188	—
	8	—	9.188	—
63	1	—	2.687	—
	2	50	3.687	92.8
	3	75	4.687	117.8
	4	100	5.687	142.8
	5	—	6.687	—
	6	—	7.687	—
	7	—	8.687	—
	8	—	9.687	—

SIZE	TRAVEL		A	
	in	mm	in	mm
1	—	—	2.341	—
2	50	—	3.431	86.3
3	75	—	4.431	111.3
4	100	—	5.431	136.3
5	—	—	6.431	—
6	—	—	7.431	—
7	—	—	8.431	—
8	—	—	9.431	—
1	—	—	2.627	—
2	50	—	3.627	91.3
3	75	—	4.627	116.3
4	100	—	5.627	141.3
5	—	—	6.627	—
6	—	—	7.627	—
7	—	—	8.627	—
8	—	—	9.627	—
1	—	—	2.687	—
2	50	—	3.687	92.8
3	75	—	4.687	117.8
4	100	—	5.687	142.8
5	—	—	6.687	—
6	—	—	7.687	—
7	—	—	8.687	—
8	—	—	9.687	—

BREAKAWAY

Breakaway pressure is affected by several factors including the load at the tool plate, slide travel, and lubrication condition of the unit. The following formulas yield approximate breakaway pressure for the Series SxL/SxH Slides.



APPROXIMATE BREAKAWAY PRESSURE

SIZE	SxL		SxH	
	psi	bar	psi	bar
08	—	—	(L x 13.78) + 20	(L x 0.214) + 1.38
10	(L x 7.03) + 20	(L x 0.109) + 1.38	(L x 8.34) + 20	(L x 0.129) + 1.38
14	(L x 2.87) + 20	(L x 0.044) + 1.38	(L x 3.48) + 20	(L x 0.054) + 1.38
20	(L x 1.17) + 20	(L x 0.018) + 1.38	(L x 1.47) + 20	(L x 0.023) + 1.38
25	(L x 0.69) + 20	(L x 0.011) + 1.38	(L x 0.87) + 20	(L x 0.013) + 1.38
32	(L x 0.37) + 20	(L x 0.006) + 1.38	(L x 0.48) + 20	(L x 0.008) + 1.38
40	—	—	(L x 0.31) + 20	(L x 0.0046) + 1.38
50	—	—	(L x 0.19) + 20	(L x 0.0029) + 1.38
63	—	—	(L x 0.10) + 20	(L x 0.0015) + 1.38

SIZING AND APPLICATION ASSISTANCE

See PHD Product Sizing Catalog for specific and complete sizing information.

Online sizing assistance is available at:
www.phdinc.com/apps/sizing

ENGINEERING DATA: SERIES SxL/SxH SLIDES

SLIDE SPEEDS

Slide speeds and time required for the slide to extend or retract are dependent upon many application conditions. The table below shows the approximate speed and time for units with no load and

with a typical attached load weight as listed to the right of the table.

NOTE: Flow controls are highly recommended to control impact velocity within maximum allowable kinetic energy as specified in the Sizing Catalog.

SIZE	TRAVEL in mm	NO LOAD, MAX VELOCITY				WITH GIVEN LOAD TOTAL, MAX KE WITH -AE OPTION				TOTAL MOVING LOAD WEIGHT lb N	
		EXTEND		RETRACT		EXTEND		RETRACT			
		TIME sec	PEAK SPEED in/sec m/sec	TIME sec	PEAK SPEED in/sec m/sec	TIME sec	IMPACT SPEED in/sec m/sec	TIME sec	IMPACT SPEED in/sec m/sec		
08	1/2 12	.023	86 2.18	.026	70 1.78	.079	24 0.61	.079	24 0.61	1 4.4	
	1 25	.030	105 2.67	.034	93 2.36	.092	24 0.61	.092	24 0.61		
	1-1/2 40	.037	130 3.30	.042	115 2.92	.110	24 0.61	.110	24 0.61		
10	1/2 12	.023	86 2.18	.026	84 2.13	.085	24 0.61	.085	24 0.61	2 8.9	
	1 25	.030	105 2.67	.033	100 2.54	.113	24 0.61	.119	24 0.61		
	1-1/2 40	.037	130 3.30	.040	120 3.05	.140	24 0.61	.152	24 0.61		
	2 —	.044	130 3.30	.047	120 3.05	.165	24 0.61	.166	24 0.61		
	3 —	.058	130 3.30	.061	120 3.05	.216	24 0.61	.217	24 0.61		
14	4 —	.072	130 3.30	.075	120 3.05	.268	24 0.61	.269	24 0.61	4 17.8	
	1/2 12	.024	82 2.08	.024	82 2.08	.082	24 0.61	.082	24 0.61		
	1 25	.032	98 2.49	.032	98 2.49	.113	24 0.61	.114	24 0.61		
	1-1/2 40	.040	120 3.05	.040	120 3.05	.143	24 0.61	.145	24 0.61		
	2 —	.048	120 3.05	.048	120 3.05	.165	24 0.61	.166	24 0.61		
	3 —	.064	120 3.05	.064	120 3.05	.216	24 0.61	.217	24 0.61		
	4 —	.080	120 3.05	.080	120 3.05	.268	24 0.61	.269	24 0.61		
	5 —	.096	120 3.05	.096	120 3.05	.320	24 0.61	.321	24 0.61		
20	6 —	.112	120 3.05	.112	120 3.05	.371	24 0.61	.372	24 0.61	10 44.5	
	1 25	.040	100 2.54	.040	100 2.54	.139	24 0.61	.143	24 0.61		
	2 50	.056	110 2.79	.056	110 2.79	.191	24 0.61	.195	24 0.61		
	3 75	.072	110 2.79	.072	110 2.79	.242	24 0.61	.246	24 0.61		
	4 —	.088	110 2.79	.088	110 2.79	.294	24 0.61	.298	24 0.61		
	5 —	.104	110 2.79	.104	110 2.79	.346	24 0.61	.350	24 0.61		
	6 —	.120	110 2.79	.120	110 2.79	.397	24 0.61	.401	24 0.61		
	7 —	.136	110 2.79	.136	110 2.79	.449	24 0.61	.453	24 0.61		
	8 —	.152	110 2.79	.152	110 2.79	.501	24 0.61	.505	24 0.61		
25	1 25	.044	78 1.98	.047	78 1.98	.132	24 0.61	.137	24 0.61	16 71.2	
	2 50	.067	75 1.91	.070	75 1.91	.184	24 0.61	.189	24 0.61		
	3 75	.090	72 1.83	.093	72 1.83	.235	24 0.61	.240	24 0.61		
	4 —	.113	72 1.83	.116	72 1.83	.287	24 0.61	.292	24 0.61		
	5 —	.136	72 1.83	.139	72 1.83	.339	24 0.61	.344	24 0.61		
	6 —	.159	72 1.83	.162	72 1.83	.390	24 0.61	.395	24 0.61		
	7 —	.182	72 1.83	.185	72 1.83	.442	24 0.61	.447	24 0.61		
	8 —	.205	72 1.83	.208	72 1.83	.494	24 0.61	.499	24 0.61		
32	1 25	.051	50 1.27	.057	42 1.07	.126	24 0.61	.132	24 0.61	25 111.2	
	2 50	.082	48 1.22	.093	40 1.02	.178	24 0.61	.184	24 0.61		
	3 75	.113	46 1.17	.129	38 0.97	.229	24 0.61	.235	24 0.61		
	4 —	.144	46 1.17	.165	38 0.97	.281	24 0.61	.287	24 0.61		
	5 —	.175	46 1.17	.201	38 0.97	.333	24 0.61	.339	24 0.61		
	6 —	.206	46 1.17	.237	38 0.97	.384	24 0.61	.390	24 0.61		
	7 —	.237	46 1.17	.273	38 0.97	.436	24 0.61	.442	24 0.61		
	8 —	.268	46 1.1	.309	38 0.97	.488	24 0.61	.494	24 0.61		
40	1 —	.064	68 1.73	.070	61 1.55	.131	24 0.61	.142	24 0.61	35 156	
	2 50	.091	82 2.08	.100	71 1.80	.183	24 0.61	.194	24 0.61		
	3 75	.118	99 2.51	.130	84 2.13	.234	24 0.61	.245	24 0.61		
	4 100	.145	89 2.26	.160	74 1.88	.286	24 0.61	.297	24 0.61		
	5 —	.172	78 1.98	.190	63 1.60	.338	24 0.61	.349	24 0.61		
	6 —	.199	68 1.73	.220	59 1.50	.389	24 0.61	.400	24 0.61		
	7 —	.226	59 1.50	.250	54 1.37	.441	24 0.61	.452	24 0.61		
	8 —	.253	59 1.50	.280	54 1.37	.493	24 0.61	.504	24 0.61		
50	1 —	.066	76 1.93	.072	69 1.75	.198	24 0.61	.256	24 0.61	47 209	
	2 50	.099	74 1.88	.105	57 1.45	.250	24 0.61	.308	24 0.61		
	3 75	.132	71 1.80	.138	57 1.45	.301	24 0.61	.359	24 0.61		
	4 100	.165	68 1.73	.171	55 1.40	.353	24 0.61	.411	24 0.61		
	5 —	.198	65 1.65	.204	52 1.32	.405	24 0.61	.463	24 0.61		
	6 —	.231	60 1.52	.237	50 1.27	.456	24 0.61	.514	24 0.61		
	7 —	.264	57 1.45	.270	47 1.19	.508	24 0.61	.566	24 0.61		
	8 —	.297	54 1.37	.303	44 1.12	.560	24 0.61	.618	24 0.61		
63	1 —	.092	62 1.57	.092	57 1.45	.146	24 0.61	.169	24 0.61	61 272	
	2 50	.134	58 1.47	.140	54 1.37	.198	24 0.61	.221	24 0.61		
	3 75	.176	54 1.37	.188	52 1.32	.249	24 0.61	.272	24 0.61		
	4 100	.218	50 1.27	.236	48 1.22	.301	24 0.61	.324	24 0.61		
	5 —	.260	48 1.22	.284	48 1.22	.353	24 0.61	.376	24 0.61		
	6 —	.302	48 1.22	.332	48 1.22	.404	24 0.61	.427	24 0.61		
	7 —	.344	48 1.22	.380	48 1.22	.456	24 0.61	.479	24 0.61		
	8 —	.386	48 1.22	.428	48 1.22	.508	24 0.61	.531	24 0.61		

SxL, SxH

NOTE: The approximate tabled time and speed is based on:

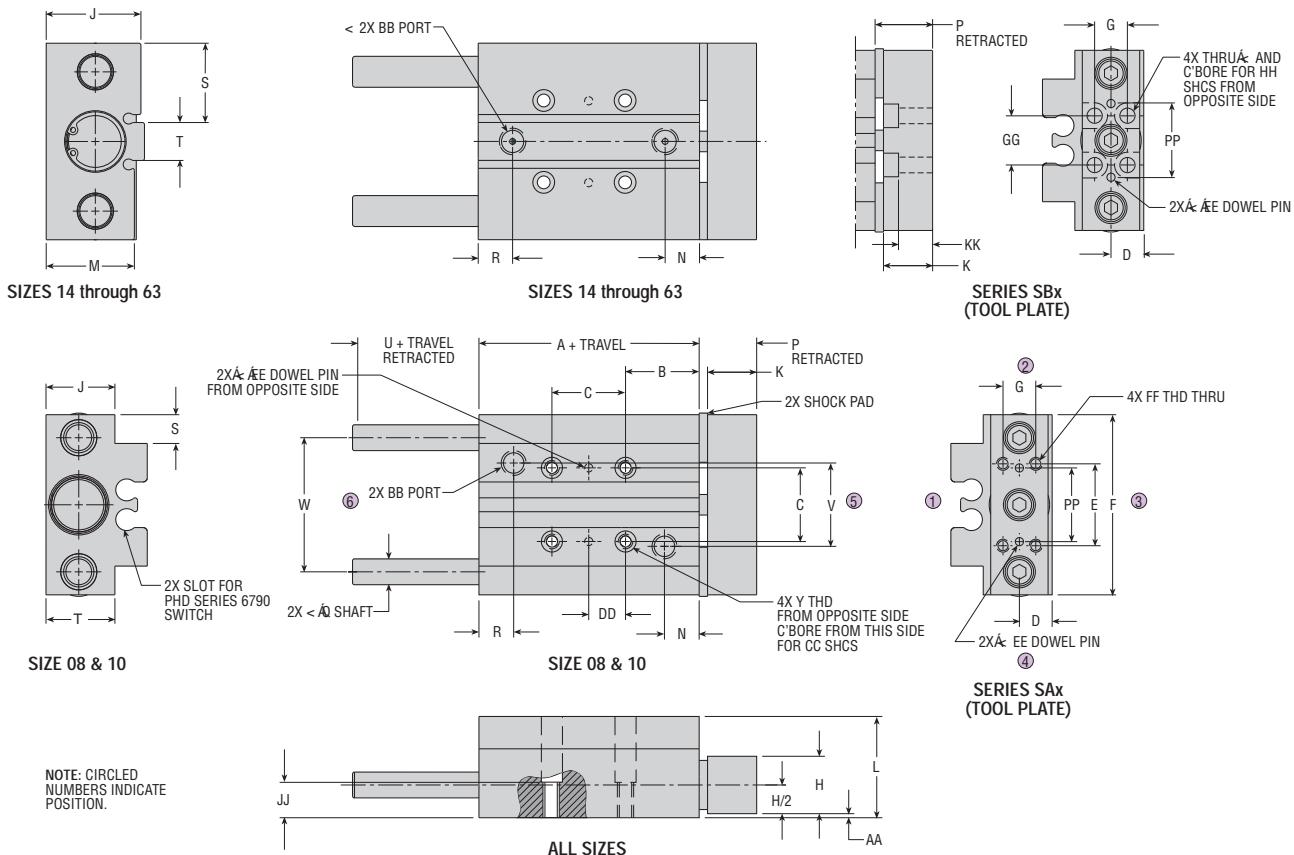
1) Sizes 08 - 32 mm- line pressure 87 psi, 2) Valve rated at 1.35 CV², 3).28 I.D. tubing, 4) Horizontal operation

2) Sizes 40 & 50 mm- line pressure 87 psi, 2) Value rated at 5.1 CV², 3).281 ID tubing, 4) Horizontal operation

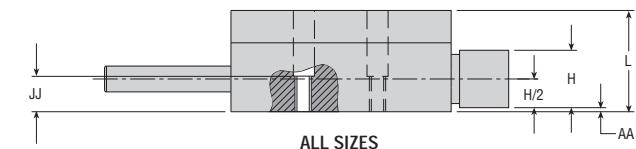
3) Size 63 mm- line pressure 87 psi, 2) Value rated at 5.1 CV², 3).39 ID tubing, 4) Horizontal operation

DIMENSIONS: SERIES SxL/SxH SLIDES - STANDARD TRAVELS

SxL, SxH



NOTE: CIRCLED NUMBERS INDICATE POSITION.



DOWEL HOLE DIAMETERS

SIZE	EE DOWEL HOLE	PRODUCTION DIAMETER	J3 OPTION TRANSITIONAL	J4 OPTION CLEARANCE FIT	J8 OPTION PRECISION FIT
08	.0625 x .16 DP [2 x 4 DP]	* [+.010 / -.024]	+.0013 / +.0000 [+.033 / +.008]	+.0038 / +.0028 —	[+.010 / -.000]
10	.0937 x .20 DP [2.5 x 5 DP]	* [+.010 / -.024]	+.0013 / +.0000 [+.033 / +.008]	+.0038 / +.0028 —	[+.010 / -.000]
14	.1250 x .24 DP [3 x 6 DP]	* [+.010 / -.024]	+.0013 / +.0000 [+.033 / +.008]	+.0038 / +.0028 —	[+.010 / -.000]
20	.1875 x .35 DP [4 x 9 DP]	* [+.010 / -.024]	+.0013 / +.0000 [+.033 / +.008]	+.0038 / +.0028 —	[+.012 / -.000]
25	.2500 x .47 DP [6 x 12 DP]	* [+.010 / -.024]	+.0013 / +.0000 [+.033 / +.008]	+.0038 / +.0028 —	[+.012 / -.000]
32	.2500 x .47 DP [6 x 12 DP]	* [+.010 / -.024]	+.0013 / +.0000 [+.033 / +.008]	+.0038 / +.0028 —	[+.012 / -.000]
40	.3125 x .63 DP [8 x 16 DP]	* [+.010 / -.024]	+.0013 / +.0000 [+.033 / +.008]	+.0038 / +.0028 —	[+.015 / -.000]
50	.3125 x .63 DP [8 x 16 DP]	* [+.010 / -.024]	+.0013 / +.0000 [+.033 / +.008]	+.0038 / +.0028 —	[+.015 / -.000]
63	.375 x .79 DP [10 x 20 DP]	* [+.010 / -.024]	+.0013 / +.0000 [+.033 / +.008]	+.0038 / +.0028 —	[+.015 / -.000]

1) * ALL IMPERIAL HOUSINGS AND SB TOOL PLATES HAVE J3 DOWEL HOLES AS STANDARD

2) NUMBERS IN [] ARE FOR METRIC UNITS DESIGN #5

DOWEL HOLE AVAILABILITY

DESIGN NO.	ITEM	DOWEL HOLES		
		J3	J4	J8
1 (IMPERIAL)	HOUSING	(J3 STD)	STD	OPT
	SAx TOOL PLATE	NONE	OPT	OPT
	SBx TOOL PLATE	(J3 STD)	STD	OPT
2 (METRIC)	HOUSING	PD	OPT	—
	SAx TOOL PLATE	PD	OPT	—
	SBx TOOL PLATE	PD	OPT	—

NOTES:

1) SEE DOWEL HOLE DIAMETERS TABLE FOR DIMENSIONAL INFORMATION.

2) SEE OPTIONS SECTION FOR J3, J4, & J8 OPTONS.

3) STD = Standard OPT = Optional PD = Production Diameter

All dimensions are reference only unless specifically tolerated.

DIMENSIONS: SERIES SxL/SxH SLIDES - STANDARD TRAVELS

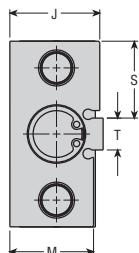
LETTER	DIM	MODEL NUMBER																			
		Sxxx08			Sxxx10			Sxxx14			Sxxx20			Sxxx25							
		in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm		
	BORE	8mm			10 mm			14 mm			20 mm			25 mm							
TRAVEL	1/2 [12]	1	[25]	1-1/2 [40]	1/2 [12]	1	[25]	1-1/2 [40]	1/2 [12]	1	[25]	1-1/2 [40]	1	[25]	2	[50]	3	[75]	1	[25]	
A		1.181	[30.0]		1.181	[30.0]			1.378	[35.0]			1.875	[48.0]			2.126	[54.0]			
B		.562	[14.0]		.562	[14.0]			.562	[14.0]			.625	[18.0]			0.787	[20.0]			
C		.562	[14.0]		.625	[16.0]			.875	[22.0]			1.250	[30.0]			1.496	[38.0]			
D		.250	[7.0]		.375	[10.0]			.500	[13.0]			.750	[19.0]			0.820	[20.8]			
E		.625	[16.0]		.750	[20.0]			1.000	[26.0]			1.500	[40.0]			1.575	[40.0]			
F		1.375	[35.0]		1.625	[41.5]			2.244	[57.0]			3.000	[76.0]			3.543	[90.0]			
G		250	[8.0]		.375	[10.0]			.500	[14.0]			.750	[20.0]			0.787	[20.0]			
H		.438	[12.0]		.610	[15.5]			.827	[21.0]			1.220	[31.0]			1.375	[34.9]			
J		.526	[14.0]		.768	[20.0]			.972	[25.0]			1.446	[36.7]			1.682	[42.7]			
K		.375	[10.0]		.375	[10.0]			.500	[14.0]			.750	[20.0]			0.875	[22.2]			
L		.773	[19.8]		.902	[23.4]			1.142	[29.3]			1.500	[38.0]			1.682	[42.7]			
M		.526	[14.0]		.768	[20.0]			.972	[25.0]			1.346	[34.2]			1.682	[42.7]			
N		265	[6.7]		.282	[7.2]			342	[8.7]			.525	[13.3]			0.575	[14.6]			
P		.437	[11.5]		.437	[11.5]			.562	[15.5]			.875	[23.0]			1.074	[27.3]			
Q		.197	[5.0]		.236	[6.0]			.394	[10.0]			.472	[12.0]			0.630	[16.0]			
R		.265	[6.7]		.220	[5.6]			.342	[8.9]			.525	[13.3]			0.575	[14.6]			
S		.220	[5.6]		.327	[8.3]			.990	[25.1]			1.240	[31.5]			1.457	[37.0]			
T		N/A							.263	[6.7]			.519	[13.2]			0.629	[16.0]			
U		.447 [12.8]	.447	[12.2]	.597	[11.4]	.447	[12.8]	.447	[12.2]	.597	[11.4]	.558	[15.5]	.558	[14.9]	.708	[14.1]	.620	[17.4]	
V		.624	[15.8]		.670	[17.0]			N/A				N/A				N/A				
W		1.024	[26.0]		1.181	[30.0]			1.614	[41.0]			2.126	[50.0]			2.598	[66.0]			
Y	#4-40 x .27 DP	[M3 x .5 x 7 DP]			#6-32 x .39 DP			[M4 x .7 x 10 DP]			#10-24 x .50 DP			[M5 x .8 x 12 DP]			1/4-20 x .63 DP			5/16-18 x .75 DP	[M8 x 1.25 x 20 DP]
AA		.031	[1.0]		.070	[2.3]			.087	[2.5]			.140	[3.5]			0.132	[3.4]			
BB	#10-32	[M5]			#10-32	[M5]			#10-32	[M5]			1/8 NPT	[G1/8 BSPP]			1/8 NPT	[G1/8 BSPP]			
CC		#2	[M2]		#4	[M3]			#6	[M4]			#10	[M5]			1/4	[M6]			
DD		.281	[7.0]		.312	[8.0]			.438	[11.0]			.625	[15.0]			0.748	[19.0]			
EE		SEE TABLE			FF	#3-48 [M2.5 x .45]			GG	SEE TABLE			HH	#4-40 [M3 x .5]			JJ	#6-32 [M4 x .7]			
GG		.375 [10.0]			HH				JJ				KK				LL				
HH		#3 [M2]			JJ				KK				MM				NN				
JJ		.270 [7.5]			LL				MM				NN				OO				
KK		.260 [7.4]			MM				OO				PP				QQ				
MM		.562 [14.0]			OO				PP				QQ				RR				

SxL, SxH

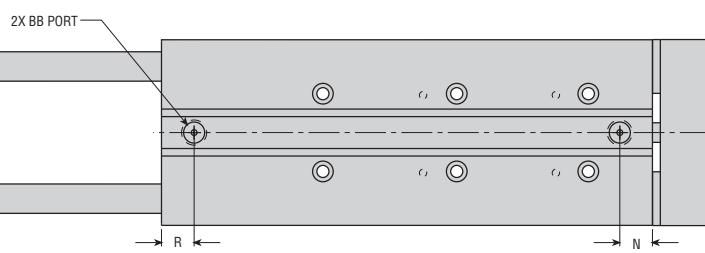
LETTER	DIM	MODEL NUMBER																			
		Sxxx32			Sxxx40			Sxxx50			Sxxx63										
		in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm		
	BORE	32 mm			40 mm			50 mm			63 mm										
TRAVEL	1	[25]	2	[50]	3	[75]	1	—	2	[50]	3	[75]	1	—	2	[50]	3	[75]	1	—	
A		2.126	[54.0]		2.402	[61.0]			2.701	[68.6]			3.445	[87.5]							
B		.813	[22.0]		.630	[16.0]			.512	[13.0]			.670	[17.0]							
C		1.688	[42.0]		2.1850	[55.5]			2.7559	[70.0]			3.2087	[81.5]							
D		1.000	[25.0]		1.063	[27.0]			1.319	[33.5]			1.575	[40.0]							
E		2.000	[52.0]		2.362	[60.0]			2.953	[75.0]			3.543	[90.0]							
F		3.937	[100.0]		5.512	[140.0]			6.496	[165.0]			7.640	[194.1]							
G		1.000	[26.0]		1.260	[32.0]			1.575	[40.0]			1.969	[50.0]							
H		1.732	[44.0]		1.890	[48.0]			2.402	[61.0]			2.913	[74.0]							
J		1.946	[49.0]		2.043	[51.9]			2.569	[65.3]			3.100	[78.7]							
K		1.000	[26.0]		1.181	[30.0]			1.378	[35.0]			1.437	[36.5]							
L		1.986	[50.0]		2.223	[56.5]			2.665	[67.7]			3.355	[85.2]							
M		1.791	[45.1]		2.043	[51.9]			2.569	[65.3]			3.100	[78.7]							
N		.575	[14.6]		.728	[18.5]			.979	[20.2]			.984	[25.0]							
P		1.197	[31.0]		1.431	[36.3]			1.628	[41.4]			1.687	[42.8]							
Q		.787	[20.0]		.984	[25.0]			1.181	[30.0]			1.375	[35.0]							
R		.575	[14.6]		.650	[16.5]			0.690	[17.5]			.984	[25.0]							
S		1.529	[38.8]		2.340	[59.4]			2.810	[71.4]			3.290	[83.6]							
T		.879	[22.3]		.840	[21.3]			.870	[22.1]			1.060	[26.9]							
U		.827 [21.8]	.827	[22.6]	.827 [23.4]				1.124	—	1.124 [30.2]	1.124 [31.0]	1.167	—	1.167 [31.2]	1.167 [32.0]	1.282	—	1.282 [34.2]	1.282 [35.0]	
V		N/A			N/A			N/A			N/A			N/A			N/A				
W		2.875	[73.0]		3.818	[97.0]			4.606	[117.0]			5.394	[137.0]							
Y		5/16-18 x .88 DP			[M8 x 1.25 x 20 DP]			3/8-16 x .84 DP			[M10 x 1.5 x 20 DP]			3/8-16 x .94			[M10 x 1.5 x 25 DP]			1/2-13 x 1.05 DP	[M12 x 1.75 x 26.5 DP]
AA		.134	[3.0]		.118	[3.0]			.118	[3.0]			.119	[3.0]							
BB		1/8 NPT [G1/8 BSPP]			1/8 NPT [1/8 BSPP]			1/8 NPT [1/8 BSPP]			1/8 NPT [1/8 BSPP]			1/4 NPT			[1/4 BSPP]				
CC		1/4	[M6]		5/16	[M8]			5/16	[M8]			3/8	[M10]			3/8	[M10]			
DD		.844	[21.0]		1.0925	[27.75]			1.3780	[35.0]			1.6044	[40.75]							
EE		SEE TABLE			FF	5/16-18 [M8 x 1.25]			GG	SEE TABLE											

DIMENSIONS: SERIES SxH SLIDES - LONG TRAVELS

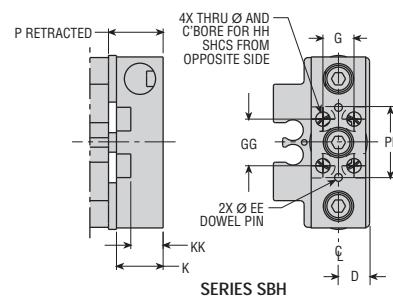
SxL, SxH



SIZES 14 - 63



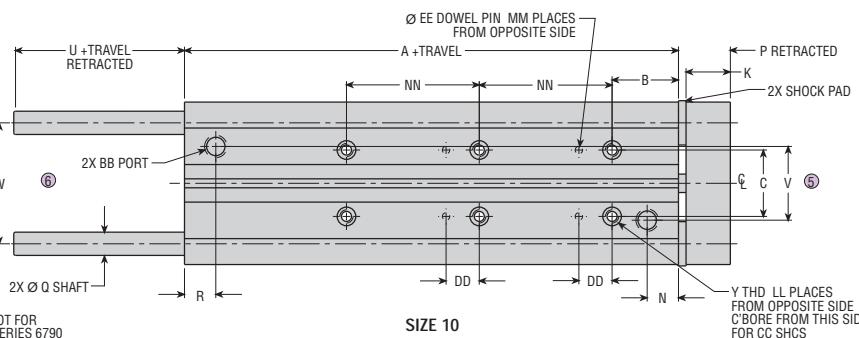
SIZES 14 - 63



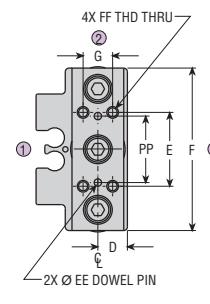
SERIES SBH
(TOOL PLATE)



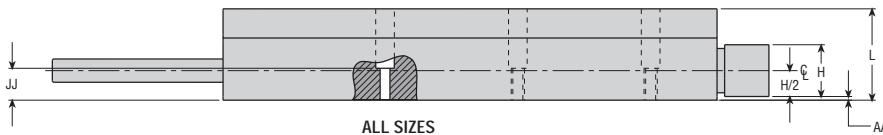
SIZE 10



SIZE 10



SERIES SAH
(TOOL PLATE)



ALL SIZES

NOTE: CIRCLED NUMBERS INDICATE POSITION.

TABLE 2 - DOWEL HOLE DIAMETERS

MODEL	EE DOWEL HOLE	PRODUCTION DIAMETER	J3 OPTION TRANSITIONAL	J4 OPTION CLEARANCE FIT	J8 OPTION PRECISION FIT
08	.0625 x .16 DP	*	+.0013 / +.0000	+.0038 / +.0028	—
10	.0937 x .20 DP	*	+.0013 / +.0000	+.0038 / +.0028	—
14	.1250 x .24 DP	*	+.0013 / +.0000	+.0038 / +.0028	—
20	.1875 x .35 DP	*	+.0013 / +.0000	+.0038 / +.0028	—
25	.2500 x .47 DP	*	+.0013 / +.0000	+.0038 / +.0028	—
32	.2500 x .47 DP	*	+.0013 / +.0000	+.0038 / +.0028	—
40	.3125 x .63 DP [8 x 16 DP]	*	+.0013 / +.0000	+.0038 / +.0028	—
	[+.010 / -.024]	+.033 / +.008	—	+.015 / -.000	
50	.3125 x .63 DP [8 x 16 DP]	*	+.0013 / +.0000	+.0038 / +.0028	—
	[+.010 / -.024]	+.033 / +.008	—	+.015 / -.000	
63	.375 x .79 DP [10 x 20 DP]	*	+.0013 / +.0000	+.0038 / +.0028	—
	[+.010 / -.024]	+.033 / +.008	—	+.015 / -.000	

NOTES:

- 1) * ALL IMPERIAL HOUSINGS AND SB TOOL PLATES HAVE J3 DOWEL HOLES AS STANDARD
- 2) NUMBERS IN [] ARE FOR METRIC UNITS DESIGN #5

DOWEL HOLE AVAILABILITY

DESIGN NO.	ITEM	DOWEL HOLES		
		J3	J4	J8
1 (IMPERIAL)	HOUSING	(J3 STD)	STD	OPT
	SAX TOOL PLATE	NONE	OPT	OPT
	SBx TOOL PLATE	(J3 STD)	STD	OPT
2 (METRIC)	HOUSING	PD	OPT	—
	SAX TOOL PLATE	PD	OPT	OPT
	SBx TOOL PLATE	PD	OPT	OPT

NOTES:

- 1) SEE DOWEL HOLE DIAMETERS TABLE FOR DIMENSIONAL INFORMATION.
- 2) STD = Standard OPT = Optional

All dimensions are reference only unless specifically tolerated.

www.phdinc.com/salsah • (800) 624-8511

DIMENSIONS: SERIES SxH SLIDES - LONG TRAVELS

SxL, SxH

* LONG TRAVEL METRIC SLIDES AVAILABLE AS STANDARD AS 100 mm TRAVEL. CONSULT PHD FOR ADDITIONAL TRAVEL LENGTHS

TABLE 1 - STROKE RELATED DIMENSIONS

TABLE 1 - STROKE RELATED DIMENSIONS										
BORE	10 mm		14 mm		20 mm		25 & 32 mm		40, 50 & 63 mm	
LETTER DIM TRAVEL	LL	MM	LL	MM	LL	MM	LL	MM	LL	MM
2.0 in	4	2	4	2	—	—	—	—	—	—
3.0 in	4	2	4	2	—	—	—	—	—	—
100 mm	—	—	—	—	—	—	—	—	4	2
4.0 in	6	4	6	4	4	2	4	2	4	2
5.0 in	—	—	6	4	6	4	4	2	4	2
6.0 in	—	—	6	4	6	4	4	2	4	2
7.0 in	—	—	—	—	6	4	6	4	6	4
8.0 in	—	—	—	—	6	4	6	4	6	4

NOTES:

- NOTES:**
1) SEE TABLE ON PREVIOUS PAGE FOR DOWEL HOLE OPTION AVAILABILITY.
2) SEE OPTIONS SECTION FOR J3, J4, & J8 OPTIONS.

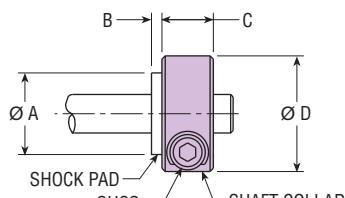
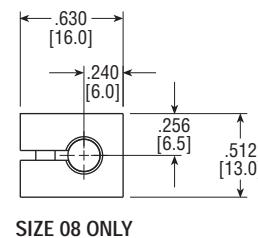
OPTIONS: SERIES SxL/SxH SLIDES



AE TRAVEL ADJUSTMENT ON EXTEND

This option provides both travel adjustment stop collars and shock pads on extension only. The travel adjustment stop collars provide infinite adjustment while the shock pads provide excellent noise reduction and energy absorption capability.

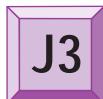
NOTE: AE travel adjustments are available as a kit. To specify, give the full unit description -H9031. Each travel adjustment kit contains 2 steel shaft collars, 2 shock pads, and 2 SHCS.



UNIT SIZE	LETTER DIMENSION [mm]			
	A	B	C	D
8	.375 [9.5]	.064 [1.6]	—	—
10	.500 [12.7]	.064 [1.6]	.315 [8.0]	.709 [18.0]
14	.591 [15.0]	.064 [1.6]	.433 [11.0]	.875 [22.2]
20	.865 [22.0]	.125 [3.2]	.511 [13.0]	1.125 [28.6]
25	.945 [24.0]	.199 [5.0]	.511 [13.0]	1.375 [34.9]
32	1.125 [28.6]	.199 [5.0]	.590 [15.0]	1.500 [38.1]
40	1.500 [38.1]	.250 [6.4]	.708 [18.0]	2.026 [51.5]
50	1.750 [44.5]	.250 [6.4]	.749 [19.0]	2.345 [59.6]
63	2.120 [53.8]	.250 [6.4]	.866 [22.0]	2.750 [69.9]

TRAVEL ADJUSTMENT KIT

UNIT SIZE	KIT NUMBER		COLLAR SCREWS	
	STANDARD	Z1 OPTION	MAX TORQUE	
8	73439-1	73439-2	22 in/lb	[2.5 Nm]
10	73440-1	73440-2	22 in/lb	[2.5 Nm]
14	73441-1	73441-2	50 in/lb	[5.6 Nm]
20	73442-1	73442-1	100 in/lb	[11.3 Nm]
25	74822-1	74822-2	100 in/lb	[11.3 Nm]
32	73443-1	73443-2	150 in/lb	[16.9 Nm]
40	79636-1	79636-2	350 in/lb	[39.5 Nm]
50	79637-1	79637-2	350 in/lb	[39.5 Nm]
63	79638-1	79638-2	700 in/lb	[79.1 Nm]



J3 TRANSITIONAL FIT DOWEL PIN HOLES

This option provides transitional fit dowel pin holes in the tool plate and housing, providing a compromise fit between clearance and interference. Transitional fits are used where accuracy of location is important, but a small amount of clearance in order to simplify the installation of dowel pins is permissible.



J4 CLEARANCE FIT DOWEL PIN HOLES

Specifying this option provides clearance fit dowel pin holes in the tool plate and housing. Clearance fits are used when extra clearance is needed due to inaccuracies of attached tooling. Available on imperial units only.



J8 PRECISION FIT DOWEL PIN HOLES

Specifying this option provides H7 tolerance precision fit dowel pin holes in the tool plate and housing. Precision fits are used where accuracy of location is of prime importance and for parts requiring rigidity and alignment. Available on metric units only.



Q6 TOTAL CORROSION RESISTANT GUIDE SHAFTS

This option provides stainless steel hard chrome guide shafts on the Series SxL Slides and corrosion resistant coating on the Series SxH Slides for use in applications where moisture may corrode untreated, hardened and ground shafts.

NOTE: For sizes and locations, see dimension pages.



Z1 TOTAL CORROSION RESISTANT UNIT

This option includes Q6 guide shafts and provides stainless steel or electroless nickel plating on all other externally exposed ferrous parts. This optional plating can be used for protecting the slide from severe or corrosive environments.



M MAGNET FOR PHD SERIES 6790 MINIATURE REED AND SOLID STATE SWITCHES

This option equips the unit with a magnetic piston for use with PHD's Series 6790 Switch. The switch housing is completely contained by the slide housing and provides a very compact switch design. The switches mount easily to the slide housing using two small grooves located on the top of the unit and are locked into place with a set screw. See Switches and Sensors section for additional switch information and complete specifications.

PART NO.	DESCRIPTION
67902-1-02	NPN (Sink) or PNP (Source) DC Reed, 2 m cable
67902-1-05	NPN (Sink) or PNP (Source) DC Reed, 5 m cable
67903-1-02	NPN (Sink) DC Solid State, 2 m cable
67903-1-05	NPN (Sink) DC Solid State, 5 m cable
67904-1-02	PNP (Source) DC Solid State, 2 m cable
67904-1-05	PNP (Source) DC Solid State, 5 m cable
67922-1	NPN (Sink) or PNP (Source) DC Reed, Quick Connect
67929-2	AC Reed, Current Limited, Quick Connect
67923-1	NPN (Sink) DC Solid State, Quick Connect
67924-1	PNP (Source) DC Solid State, Quick Connect
63549-02	2 m Cordset with Quick Connect
63549-05	5 m Cordset with Quick Connect

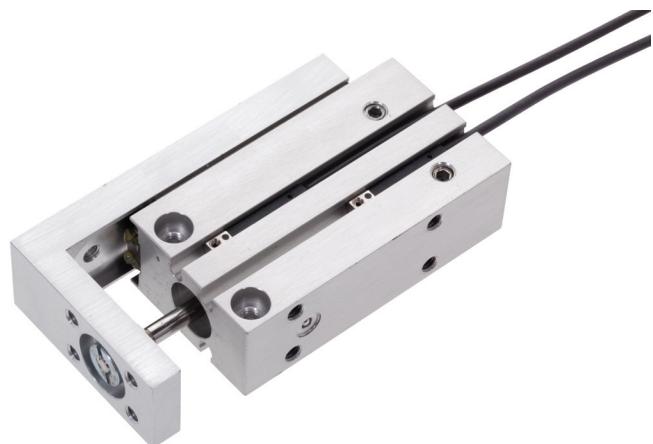
NOTES:

- 1) Switch set screw torque to 16 in-oz [.11 Nm] max.
- 2) See Switches and Sensors section for additional switch information and complete specification.



C-slot Drop-in Magnetic Field Sensor - BMF 243 Flush mounting compact sensor for position detection

Introducing the newest member of Balluff's magnetic field sensors, the BMF 243 – drop-in C-slot sensor. Based on GMR technology these sensors provide improved sensor performance and better reliability that results in less downtime and increased productivity. Like the other Balluff magnetic field sensors, the BMF 243 is backed by our exclusive **LIFETIME** warranty, you install and forget them.



Features

- Installs from above - drop-in installation
- Superior holding strength
- Miniature design for short stroke cylinders
- Precise, accurate switch point
- Short circuit, overload and reverse polarity protected



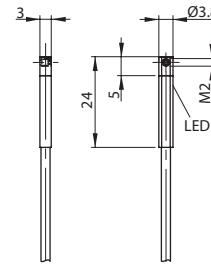
TWIN versions provide substantial savings:

- Two sensors - one connector
- Lower initial costs
- Less hardware, cables and installation time



Standard Specifications:

- 10...30 V DC
- -25...+85° C
- IP 67
- Plastic Housing
- Flexible PUR Cable
- CE, cULus



Know your cylinder? Find your sensor.

Balluff's exclusive, easy to use online Pneumatic cylinder Resource Center is designed to help you select the best solution for specific cylinder models. Visit: www.balluff.us/bmfccenter

Ordering code	Part number	Features
BMF00EK	BMF 243K-NO-C-2A-PU-02	NPN, NC, 2 meter cable
BMF00EP	BMF 243K-NO-C-2A-SA2-S49-00,3	NPN, NC, 0.3m Pigtail with M8 Connector
BMF00EJ	BMF 243K-NS-C-2A-PU-02	NPN, NO, 2 meter cable
BMF00EN	BMF 243K-NS-C-2A-SA2-S49-00,3	NPN, NO, 0.3m Pigtail with M8 Connector
BMF00EH	BMF 243K-PO-C-2A-PU-02	PNP, NC, 2 meter cable
BMF00EM	BMF 243K-PO-C-2A-SA2-S49-00,3	PNP, NC, 0.3m Pigtail with M8 Connector
BMF00EF	BMF 243K-PS-C-2A-PU-02	PNP, NO, 2 meter cable
BMF00ER	BMF 243K-PS-C-2A-SA2-S4-00,3	PNP, NO, 0.3m Pigtail with M12 Connector
BMF00EL	BMF 243K-PS-C-2A-SA2-S49-00,3	PNP, NO, 0.3m Pigtail with M8 Connector
BMF00F3	BMF 243K-PS-C-2A-SA2-S49-00,5	PNP, NO, 0.5m Pigtail with M8 Connector
BMF00F4	BMF 243K-PS-C-2A-SA2-S49-01	PNP, NO, 1m Pigtail with M8 Connector
BMF00ET	BMF 243K-PS-C-2A-SA95-S75-00,3	PNP, NO, 0.3m Pigtail with M8 Connector, V-Twin
BMF00F9	BMF 243K-PS-C-2A-SA95-S4-00,3	PNP, NO, 0.3m Pigtail with M12 Connector, V-Twin
BMF00ET	BMF 243K-PS-C-2A-SA95-S75-00,3	PNP, NO, 0.3m Pigtail with M8 connector, V-Twin
BMF00FA	BMF 243K-NS-C-2A-SA95-S4-00,3	NPN, NO, 0.3m Pigtail with M12 connector, V-Twin

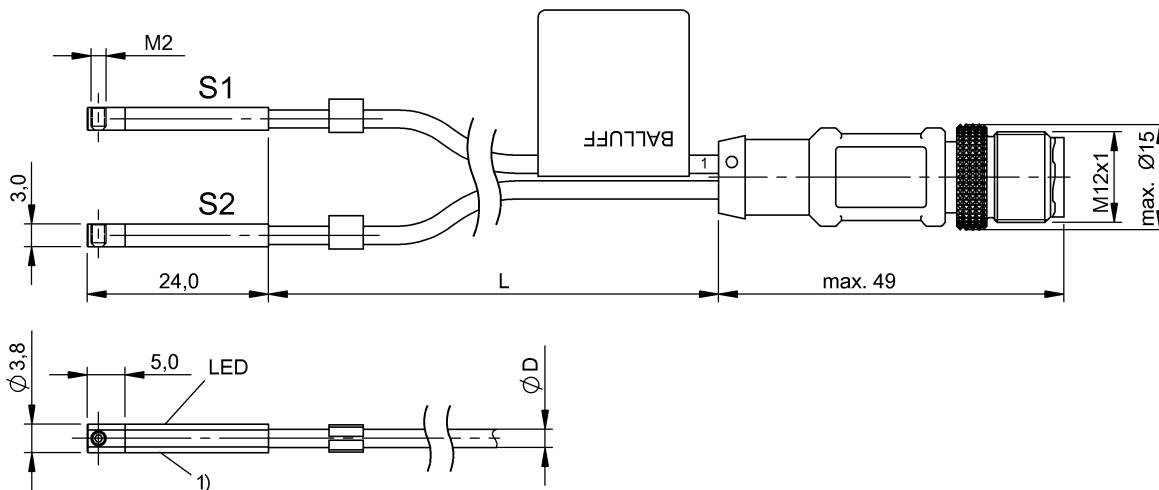
BMF 243K-PS-C-2A-SA95-S4-00,3
Ordering code: BMF00F9

BALLUFF

sensors worldwide

Sensors for cylinders
 BMF 243
 Cylinder housing: C-slot

PNP, Normally open (NO)
 V-twin



Characteristic data

Connection type	Cable with connector
Operating voltage	10...30 V DC
Trademark	GLOBAL
Short-circuit protected	yes
Protected against polarity reversal	yes
Protected against miswiring	yes
Area of application	Pneumatic cylinder with C-slot, e. g. SMC, Festo*, Schunk, Sommer, Gimatic (*not suitable for Festo model series ADVC und AEVC)

Electrical data

Electrical version	DC, direct current
Rated operating voltage Ue DC	24,0 V
Effective operating current Ie	100 mA
Rated insulation voltage Ui	75 DC
Rated short circuit current	100 A
Output resistance Ra	Open drain
Load capacitance max. (at Ue)	0,45 µF
No-load current Io damped max.	15 mA
Max. no-load cur. Io undamped	8 mA
Off-state current Ir max.	10 µA
Ripple max. (% of Ue)	15
Switching freq. f max.	3000 Hz
Voltage drop static max.	2 V
Turn-off delay toff max.	0,07 ms
Turn-on delay ton max.	0,07 ms

Rated switching field strength
 Assured switching field strength
 Hysteresis H max. (in % of Hn)

2 kA/m
 2,4 kA/m
 45 %

Mechanical data

Housing material	PA 12
Sensing surface material	PA 12
Cable jacket material	PUR
Cable short designation	Li12Y11Y-O
Cable length	0,3 m
Cable diameter D max.	2,4 mm
Connector type	M12x1-S04
Ambient temperature	-25...85 °C
Temperature drift max. % of Hn	0,3 %
Mounting type	used in C-slot from above
Tightening torque	0,07 Nm

Basic data

Enclosure Type per IEC 60529	IP67
Degree of contamination	3
Basic standard	IEC 60947-5-2
Utilisation category	DC 13

Remarks

Mounting instruction	889416
Scope of delivery	Angled screwdriver DIN 911 Size 0.9
	Cable clip for C-slot

The sensor is functional again after the overload has been eliminated.



LISTED IND. CONT. EQ. 81U2
 for use in the secondary of
 a class 2 source of supply

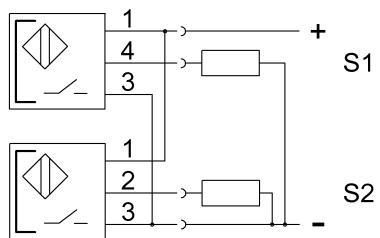
BMF 243K-PS-C-2A-SA95-S4-00,3
Ordering code: BMF00F9

Sensors for cylinders
BMF 243
Cylinder housing: C-slot

PNP, Normally open (NO)
V-twin

BALLUFF

sensors worldwide



Filter / Regulator

B18



B18-02-FKG0

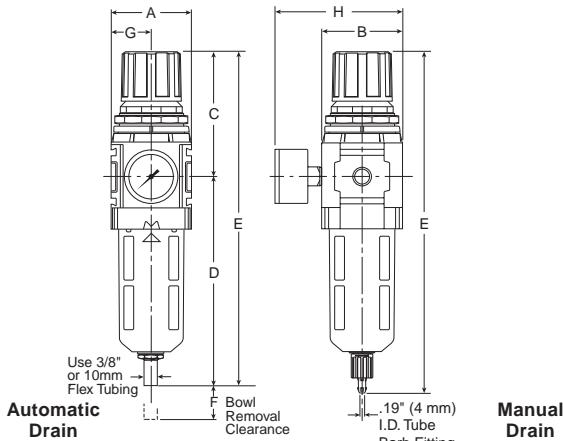
Features

- 5 Micron Filtration
- Balanced Valve Design
- Spring Loaded Diaphragm
- 1/2" NPT / BSPP-G Over-Ported
- Quick-Disconnect Bowl / Bowl Guard
- Light Weight
- High Flow Capacities

WARNING

Product rupture can cause serious injury.
Do not connect regulator to bottled gas.

Do not exceed maximum primary pressure rating.



Dimensions

Models	Inches (mm)	A	B	C	D	E	F	G	H
Standard Unit with Manual Drain B18-XX-FK00		2.36 (60)	2.36 (60)	3.66 (93)	6.34 (161)	10.00 (254)	1.60 (41)	1.20 (30)	3.74 (95)
Automatic Drain B18-XX-FG00		2.36 (60)	2.36 (60)	3.66 (93)	6.11 (155)	9.77 (248)	1.60 (41)	1.20 (30)	3.74 (95)
Metal Bowl with Sight Gauge / Manual Drain		2.36 (60)	2.70 (69)	3.66 (93)	6.34 (161)	10.00 (254)	1.60 (41)	1.20 (30)	3.74 (95)
Metal Bowl with Sight Gauge / Automatic Drain		2.36 (60)	2.70 (69)	3.66 (93)	6.11 (155)	9.77 (248)	1.60 (41)	1.20 (30)	3.74 (95)

= "Most Popular"

Specifications

Flow Capacity*	1/4	88 SCFM (41.5 dm ³ /s)
	3/8	117 SCFM (55.2 dm ³ /s)
	1/2	121 SCFM (57.1 dm ³ /s)

Adjusting Range Pressure	0 to 30 PSIG (0 to 2.1 bar)
	0 to 60 PSIG (0 to 4.1 bar)
	0 to 125 PSIG (0 to 8.6 bar)
	0 to 250 PSIG (0 to 17.2 bar)

Gauge Port (2)	NPT / BSPP-G	1/4
Maximum Supply Pressure	Plastic Bowl	150 PSIG (10.3 bar)
	Metal Bowl	250 PSIG (17.2 bar)
Operating Temperature	Plastic Bowl	-13° to 125°F (-25° to 52°C)
	Metal Bowl	-13° to 150°F (-25° to 65.5°C)
Port Size	NPT / BSPP-G	1/4, 3/8, 1/2
Standard Filtration		5 Micron
Weight		1.48 lb. (0.67 kg)

* Inlet pressure 100 PSIG (6.9 bar). Secondary pressure 90 PSIG (6.2 bar).

"F" Series Filters, Type "A" 5 micron elements: All Wilkerson Type "A" 5 micron elements meet or exceed ISO Class 3 for maximum particle size and concentration of solid contaminants.

Materials of Construction

Adjustment Knob	Acetal
Body	Zinc
Body Cap	ABS
Bowl	Plastic Bowl Polycarbonate Metal Bowl Aluminum
Bowl Guard	Nylon
Diaphragm Assembly	Nitrile / Zinc
Element Retainer / Baffle	Acetal
Filter Element	Sintered Polyethylene
Panel Nut	Acetal
Seals	Plastic Bowl Nitrile Metal Bowl Nitrile
Sight Gauge	Metal Bowl Polyamide (Nylon)
Springs	Main Regulating / Valve Steel / S.S.
Valve Assembly	Brass / Nitrile

CAUTION:

REGULATOR PRESSURE ADJUSTMENT – The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design.

For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

= "Most Popular"

Replacement Bowl Kits

Metal Bowl –

- Sight Gauge, Automatic Drain GRP-96-637
- Sight Gauge, Manual Drain..... GRP-96-636

Plastic Bowl –

- Bowl Guard, Automatic Drain..... GRP-96-635
- Bowl Guard, Manual Drain..... GRP-96-634
- Bowl Guard, Closed Bottom GRP-96-638

Replacement Element Kits

- Type "A", 5 Micron FRP-96-639
- Retainer, Deflector, and Element Kit FRP-96-641

Replacement Kits

- Adjusting Knob..... RRP-16-340-000

Diaphragm Assembly –

- Non-relievingRRP-96-657
- Relieving.....RRP-96-656

Spring, Regulating –

- 0 to 30 PSIG (0 to 2.1 bar).....RRP-96-659
- 0 to 60 PSIG (0 to 4.1 bar).....RRP-96-660
- 0 to 125 PSIG (0 to 8.6 bar).....RRP-96-661
- 0 to 250 PSIG (0 to 17.2 bar)RRP-96-662

- Valve Assembly.....RRP-96-658

Accessories

Automatic Drain –

- FluorocarbonGRP-95-981
- NitrileGRP-95-973

- Drain, Manual Override..... GRP-96-000

- Manual Drain..... GRP-96-685

Panel Mount Nut –

- Aluminum.....RRP-96-673
- PlasticRRP-96-675

Gauge, Pressure –

- 0 to 30 PSIG, 1-1/2" Dial Face, 1/4" NPT CBMK4515N14030
- 0 to 60 PSIG, 1-1/2" Dial Face, 1/4" NPT CBM ... K4515N14060
- 0 to 160 PSIG, 1-1/2" Dial Face, 1/4" NPT CBM ..K4515N14160
- 0 to 300 PSIG, 1-1/2" Dial Face, 1/4" NPT CBM. K4515N14300
- 0 to 2.0 bar, 1-1/2" Dial Face, G 1/4" CBM K4515G14030
- 0 to 4.1 bar, 1-1/2" Dial Face, G 1/4" CBM K4515G14060
- 0 to 11 bar, 1-1/2" Dial Face, G 1/4" CBMK4515G14160
- 0 to 21 bar, 1-1/2" Dial Face, G 1/4" CBMK4515G14290
- 0 to 160 PSIG, 1-3/4" Digital Round, 1/4" NPT ..K4517N14160

- Tamper Resistant Kit.....RRP-96-671

- Sight Gauge Kit..... GRP-96-825

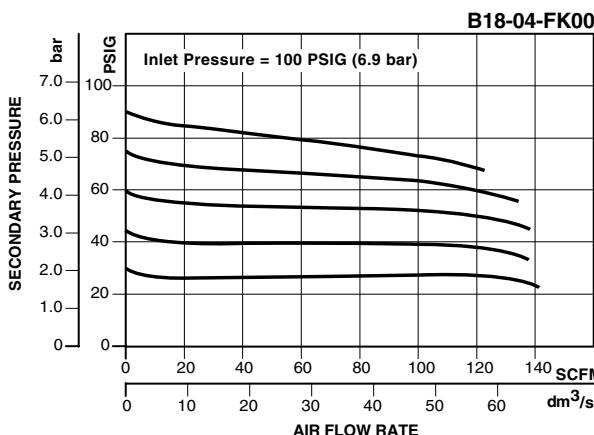
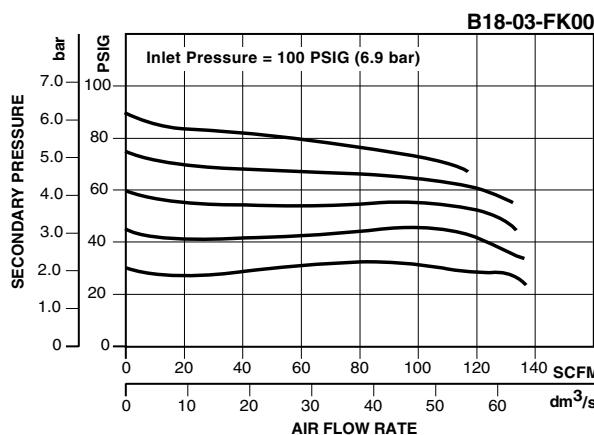
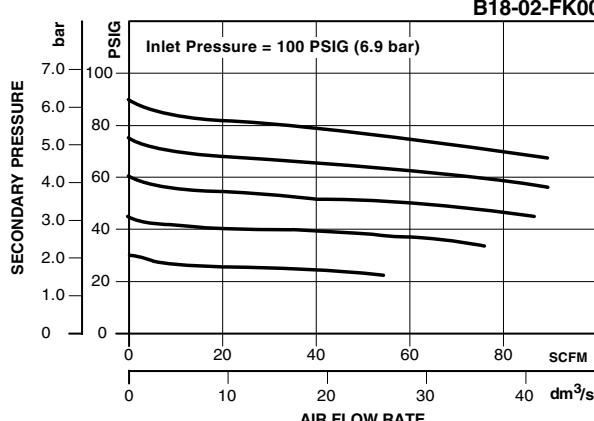
Wall Mounting Bracket

- L-Type (Body).....GPA-96-604
- L-Type (Bonnet).GPA-96-606
- T-TypeGPA-96-602

Ordering Information

Model Type	Port Size	Plastic Bowl / Bowl Guard With Gauge 5 to 125 PSIG (0.4 to 8.6 bar)	Plastic Bowl / Bowl Guard With Gauge 3 to 60 PSIG (0.2 to 4.1 bar)	Metal Bowl / Sight Gauge With Gauge 10 to 250 PSIG (0.7 to 17.2 bar)	Plastic Bowl / Bowl Guard Without Gauge 5 to 125 PSIG (0.4 to 8.6 bar)	Plastic Bowl / Bowl Guard Without Gauge 3 to 60 PSIG (0.2 to 4.1 bar)	Metal Bowl / Sight Gauge Without Gauge 10 to 250 PSIG (0.7 to 17.2 bar)
Manual Drain	1/4	B18-02-FKG0	B18-02-DKG0	B18-02-GLG0	B18-02-FK00	B18-02-DK00	B18-02-GL00
	3/8	B18-03-FKG0	B18-03-DKG0	B18-03-GLG0	B18-03-FK00	B18-03-DK00	B18-03-GL00
	1/2	B18-04-FKG0	B18-04-DKG0	B18-04-GLG0	B18-04-FK00	B18-04-DK00	B18-04-GL00
Automatic Drain	1/4	B18-02-FGG0	B18-02-DGG0	B18-02-GHG0	B18-02-FG00	B18-02-DG00	B18-02-GH00
	3/8	B18-03-FGG0	B18-03-DGG0	B18-03-GHG0	B18-03-FG00	B18-03-DG00	B18-03-GH00
	1/2	B18-04-FGG0	B18-04-DGG0	B18-04-GHG0	B18-04-FG00	B18-04-DG00	B18-04-GH00

Options - To order an option supplied with the unit model, add the appropriate coded suffix letter in the designated position of the model number.

B

Modular Ball Valve V40, V60, V73

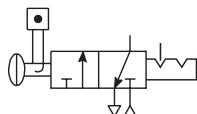


Features

The Modular Ball Valves provide shut off line pressure with a non-sticking 90° turn handle to prevent unauthorized adjustment. When the inlet pressure is turned off the downstream air pressure vents through the exhaust port. The padlock slide may be assembled on either side. It is recommended that this is assembled after mounting.

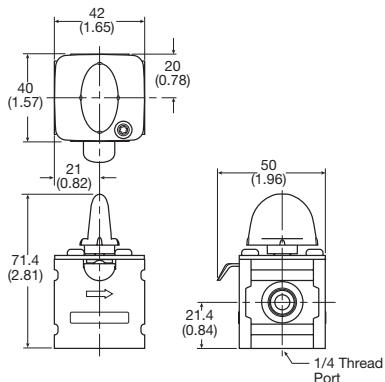
The Safety Lockout valves conform to OSHA #29 CFR part 1910 — control of hazardous energy source (lockout / tagout).

Note: This padlock slide is a permanent assembly and may not be removed later

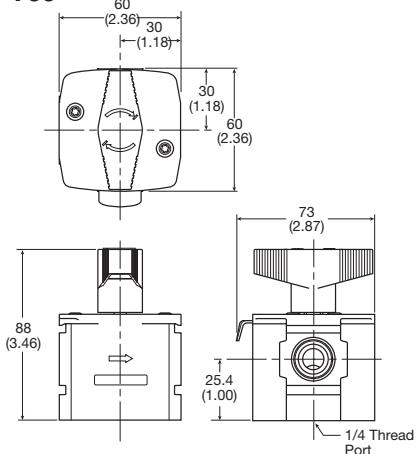


Dimensions

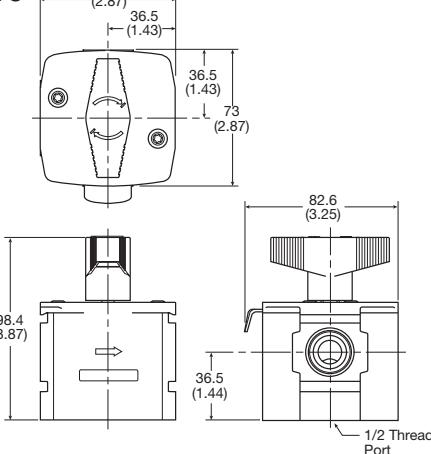
V40



V60



V73



Dimensions are in inches (mm)

Ordering Information

Model Type	Port Size	Thread Type	Flow SCFM	Modular Ball Valve Flow from left to right
V40	1/4	NPT	42	V40-02-B000B
V60	3/8	NPT	190	V60-03-B000B
	1/2	NPT	258	V60-04-B000B
V73	1/2	NPT	561	V73-04-B000B
	3/4	NPT	678	V73-06-B000B

Specifications

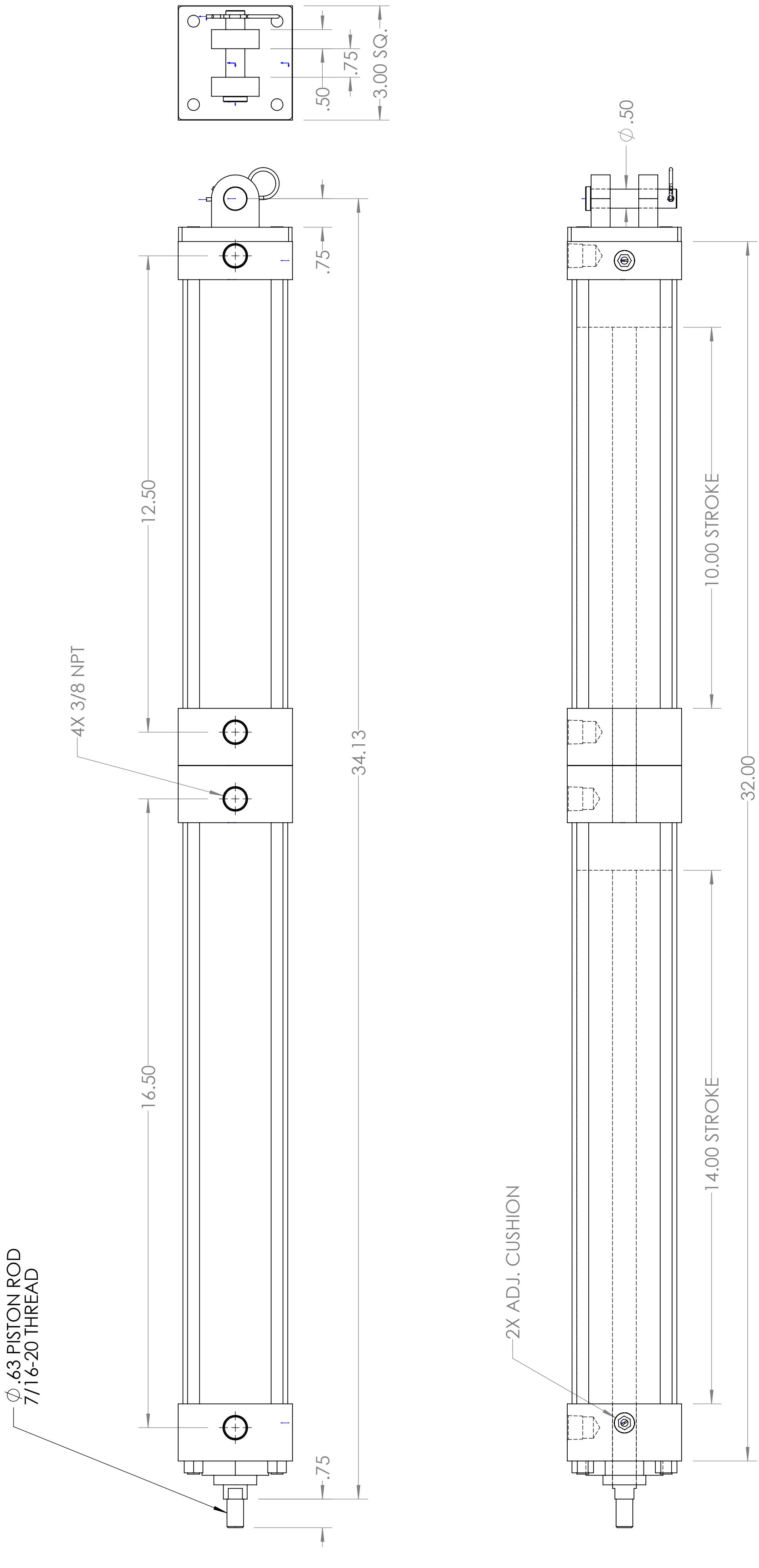
Operating Temperature	-40°C to 80°C (40°F to 176°F)	
Max. Supply Pressure	17 bar (246 psi)	
Port Size	NPT / BSPP / BSPT	1/4, 3/8, 1/2, 3/4
Weight	V40:	0.15 kg (0.33 lbs)
	V60:	0.36 kg (0.79 lbs)
	V73:	0.55 kg (1.21 lbs)

Materials of Construction

Body	Aluminum
Seals	PTFE
Ball	Brass
	Brass
	Chrome plated brass

Safety Guide

For more complete information on recommended application guidelines, see the Safety Guide section of Pneumatic Division catalogs or you can download the **Pneumatic Division Safety Guide** at: www.wilkerсонcorp.com



PROPRIETARY AND CONFIDENTIAL

THE INFORMATION CONTAINED IN THIS
DRAWING IS THE SOLE PROPERTY OF
INSERT COMPANY NAME HERE. ANY
REPRODUCTION IN PART OR AS A WHOLE
WITHOUT THE WRITTEN PERMISSION OF
INSERT COMPANY NAME HERE IS
PROHIBITED.

SIZE	DWG. NO.	REV
C	SW-040814-1	
SCALE: 1:2		WEIGHT:
		SHEET 1 OF 1

3-POSITION CYLINDERS:

You can create a 3-Position cylinder from **any** single stage series of cylinder. (Note: not available on multi-stage products)

3-Position cylinders consist of multiple cylinders built as one unit having ONE exposed working rod end, capable of delivering 3 rod positions.

3-POSITION BENEFITS:

- 3-POSITIONS IN ONE CYLINDER** — One cylinder produces three different rod end positions. By varying stroke lengths, a multitude of positions can be created.
- SIMPLIFIES MACHINE DESIGNS** — Eliminates the need for an additional cylinder to create a third position. 3-Position cylinders reduce space and the cost to mount multiple cylinders.

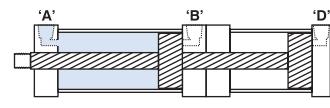
3-POSITION CYLINDERS

HOW THEY WORK

□ = PRESSURE

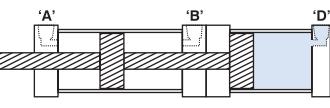
POSITION 1 (RETRACT)

Pressure to port 'A' fully retracts cylinder.



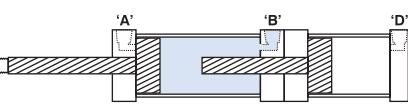
POSITION 2 (MID-STROKE)

Pressure to port 'D' advances cylinder to mid-stroke position.

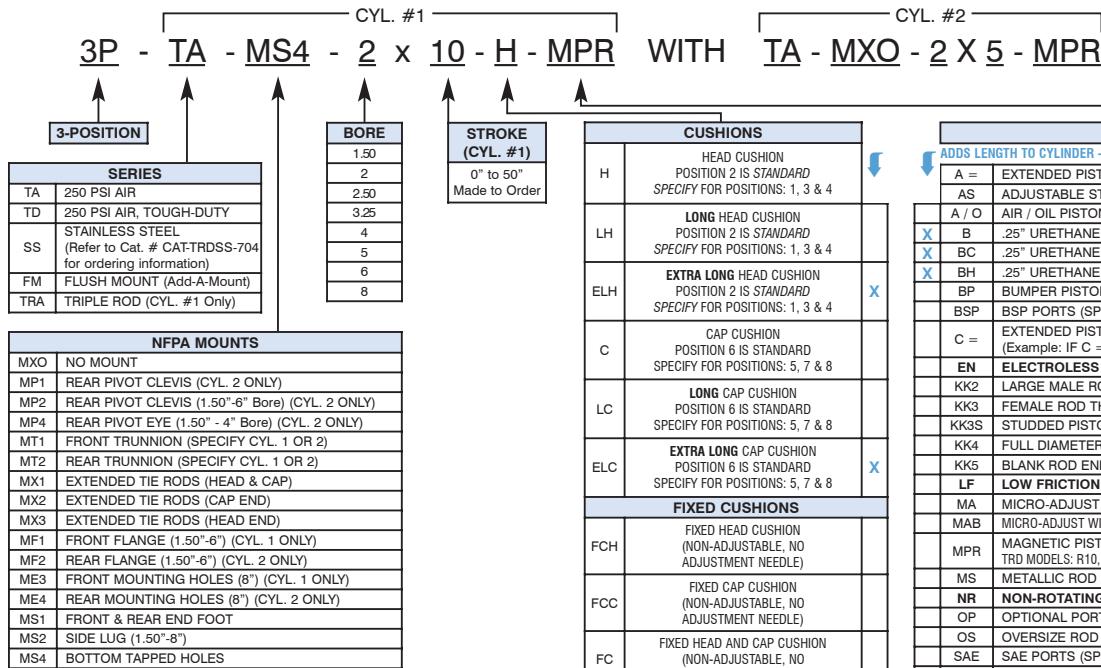


POSITION 3 (EXTEND)

Pressure to port 'B' fully extends cylinder.



HOW TO ORDER: 3-POSITION CYLINDERS



About our Part Number System

- Simple, easy to understand
- No excessive codes!
- Eliminates mistakes when ordering

Example: 3-Position

Application calls for a 2" bore cylinder with stroke positions of 0", .5" and 10", base mount on rod end cylinder only, with magnetic piston for position (switch) sensors.

Part Number:

3P-TA-MS4-2 x 10-H-MPR with
TA-MXO-2 x 5-MPR

HOW TO ORDER:

3 Position Cylinder:

Position 1 (Full Retract) - This position is always 0.00"

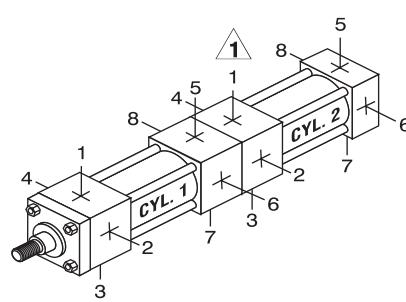
Position 2 (Mid-Stroke) - This will be the stroke of Cyl. #2

Position 3 (Full-Extend) - This will be the stroke of Cyl. #1

Multi-Position Model Available

- 3 Position (Model 3P)
- 4 Position (Model 4P)
- 5 Position (Model 5P)

(Consult factory for dimensions on 4P & 5P)



STANDARD PORT AND CUSHION ADJUSTMENT POSITIONS

- Ports - Positions 1 and 5
- Cushion Adjustment - Positions 2 and 6 (Cushions not available on CYL. 1 Cap)
- Specify Non-Standard Positions When Ordering

▲ Note: The "Head" port of CYL. 2 can be used as a "vent". (Single Acting) or "Powered" (Double Acting).

3-POSITION DIMENSIONS: BASIC CYLINDER (NO MOUNT)

About Rod End Styles

Style 1 Male Rod End is STANDARD

Other NFPA Styles can be specified (See Chart).

Need a rod end not listed?

NO PROBLEM! Each Piston Rod is made to order and does not delay shipment. Coarse (UNC) threads, Metric threads or just plain rod ends are common. Thread lengths are also made to order (Specify: "A"=Length).

NEED SOMETHING NOT LISTED?

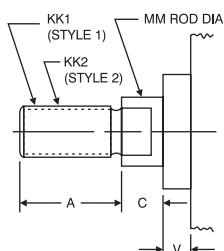
Just send us a sketch.

In most cases, quotes are turned around in one day!

PISTON ROD END STYLES

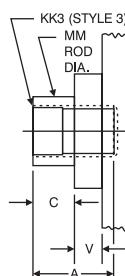
STYLE 1 & 2

KK1 & KK2



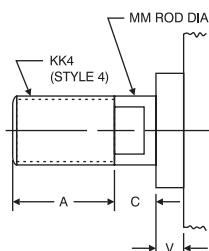
STYLE 3

KK3



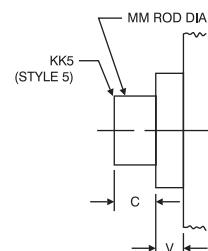
STYLE 4

KK4



STYLE 5

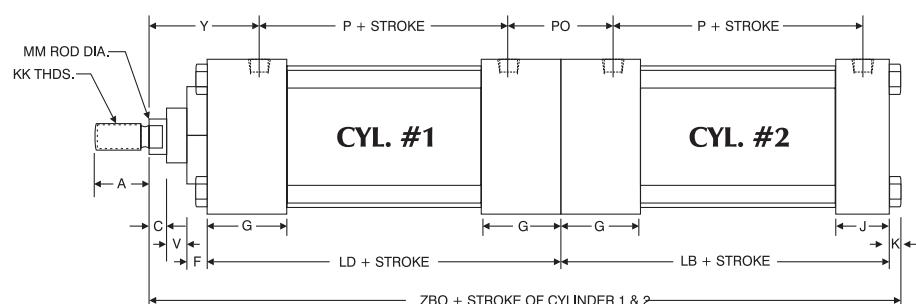
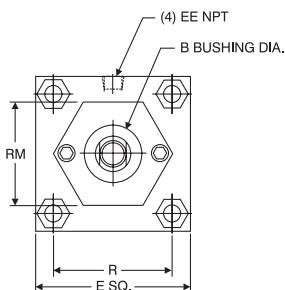
KK5



BORE	MM ROD DIAMETER	STANDARD		OPTIONAL						C	V		
		Style 1 - Male		Style 2 - Male		Style 3 - Female		Style 4 - Male		Style 5 - Blank			
		KK1	A	KK2	A	KK3	A	KK4	A	KK5			
1.50, 2, 2.50	.63 Standard	.44-20	.75	.50-20	.75	.44-20	.75	.63-18	.75	No Threads	.38	.25	
	1 Oversize	.75-16	1.13	.88-14	1.13	.75-16	1.13	1-14	1.13	No Threads	.50	.50	
3.25, 4, 5	1 Standard	.75-16	1.13	.88-14	1.13	.75-16	1.13	1-14	1.13	No Threads	.50	.25	
	1.38 Oversize	1-14	1.63	1.25-12	1.63	1-14	1.63	1.38-12	1.63	No Threads	.63	.38	
6 & 8	1.38 Standard	1-14	1.63	1.25-12	1.63	1-14	1.63	1.38-12	1.63	No Threads	.63	.38	
	1.75 Oversize	1.25-12	2	1.50-12	2	1.25-12	2	1.75-12	2	No Threads	.75	.50	

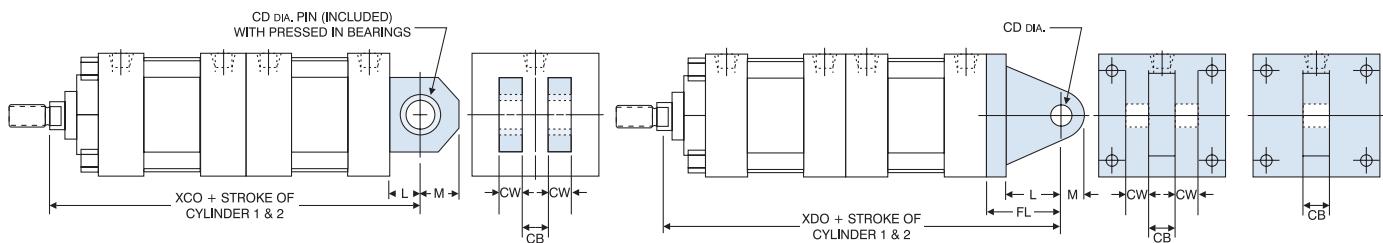
MXO/MXO

(NO MOUNT)



3-POSITION BASIC DIMENSIONS 'MXO' STANDARD & OVERSIZE RODS																					
BORE	ROD DIAMETER	A	B	C	E	EE	F	G	J	K	KK	LB	LD	MM	P	PO	R	RM	V	Y	ZBO
1.50	.63 Standard	.75	1.13	.38	2	.38	.38	1.50	1	.25	.44-20	3.63	4.13	.63	2.38	1.75	1.43	2 SQ.	.25	1.88	9
	1 Oversize	1.13	1.50	.50							.75-16			1				.50	2.25	9.38	
2	.63 Standard	.75	1.13	.38	2.50	.38	.38	1.50	1	.31	.44-20	3.63	4.13	.63	2.38	1.75	1.84	1.75 HEX	.25	1.88	9.06
	1 Oversize	1.13	1.50	.50							.75-16			1				.50	2.25	9.44	
2.50	.63 Standard	.75	1.13	.38	3	.38	.38	1.50	1	.31	.44-20	3.75	4.25	.63	2.50	1.75	2.19	1.75 HEX	.25	1.88	9.31
	1 Oversize	1.13	1.50	.50							.75-16			1				3 SQ.	.50	2.25	9.69
3.25	1 Standard	1.13	1.50	.50	3.75	.50	.63	1.75	1.25	.38	.75-16	4.25	4.75	1	2.75	2	2.76	2.75 DIA.	.25	2.38	10.75
	1.38 Oversize	1.63	2	.63							1-14			1.38				3.75 SQ.	.38	2.63	11
4	1 Standard	1.13	1.50	.50	4.50	.50	.63	1.75	1.25	.38	.75-16	4.25	4.75	1	2.75	2	3.32	2.75 DIA.	.25	2.38	10.75
	1.38 Oversize	1.63	2	.63							1-14			1.38				3.50 DIA.	.38	2.63	11
5	1 Standard	1.13	1.50	.50	5.50	.50	.63	1.75	1.25	.44	.75-16	4.50	5	1	3	2	4.10	2.75 DIA.	.25	2.38	11.31
	1.38 Oversize	1.63	2	.63							1-14			1.38				3.50 DIA.	.38	2.63	11.56
6	1.38 Standard	1.63	2	.63	6.50	.75	.63	2	1.50	.44	1-14	5	5.50	1.38	3.25	2.25	4.88	3.50 DIA.	.38	2.75	12.56
	1.75 Oversize	2	2.38	.75							1.25-12			1.75				.50	3	12.81	
8	1.38 Standard	1.63	2	.63	8.50	.75	.63	2	1.50	.56	1-14	5.13	5.63	1.38	3.38	2.25	6.44	3.50 DIA.	.38	2.75	12.81
	1.75 Oversize	2	2.38	.75							1.25-12			1.75				.50	3	13.19	

3-POSITION DIMENSIONS: PIVOT MOUNTS



MXO/MP1 MOUNT

(Extruded, 1.50" - 8" bores)

MXO/

MP2

(Casting, 1.50" - 6" bore)

MXO/

MP4

(Casting, 1.50" - 4" bore)

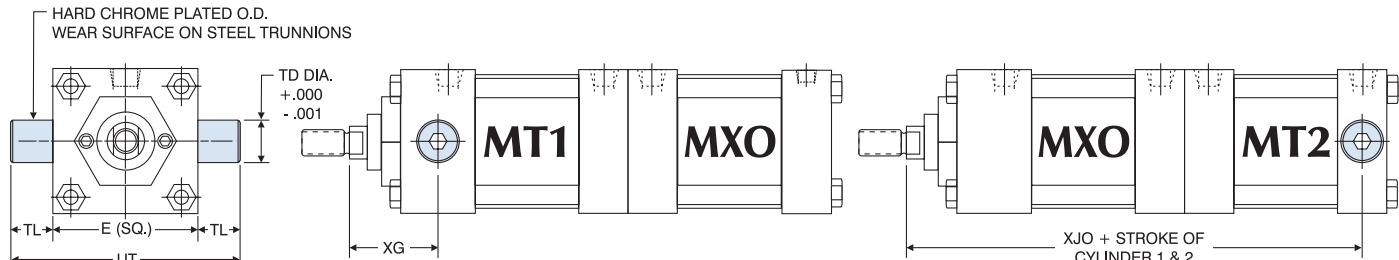
BORE	ROD DIAMETER	'MP1' & 'MP2' CLEVIS AND 'MP4' ROD EYE MOUNT DIMENSIONS						ADD STROKE	
		CB	CD	CW	FL	L	M	XCO	XDO
1.50	.63 Standard	.75	.50	.50	1.13	.75	.63	9.50	9.88
	1 Oversize							9.88	10.25
2	.63 Standard	.75	.50	.50	1.13	.75	.63	9.50	9.88
	1 Oversize							9.88	10.25
2.50	.63 Standard	.75	.50	.50	1.13	.75	.63	9.75	10.13
	1 Oversize							10.13	10.50
3.25	1 Standard	1.25	.75	.63	1.88	1.25	.88	11.63	12.25
	1.38 Oversize							11.88	12.50
4	1 Standard	1.25	.75	.63	1.88	1.25	.88	11.63	12.25
	1.38 Oversize							11.88	12.50
5	1 Standard	1.25	.75	.63	1.88	1.25	.88	12.13	12.75
	1.38 Oversize							12.38	13
6	1.38 Standard	1.50	1	.75	2.25	1.50	1	13.63	14.50
	1.75 Oversize							13.88	14.75
8	1.38 Standard	1.50	1	.75	N/A	1.50	1	13.88	N/A
	1.75 Oversize							14.13	

Clevis pins are provided with pivot mounts.

* MP4 mount not available as standard on 5" bores and above.

Note: Extruded MP1 mounts are standard (1.50" - 8" bores).

Cast iron removable mounts are optional and must be requested when ordering (1.50" - 6" bores).

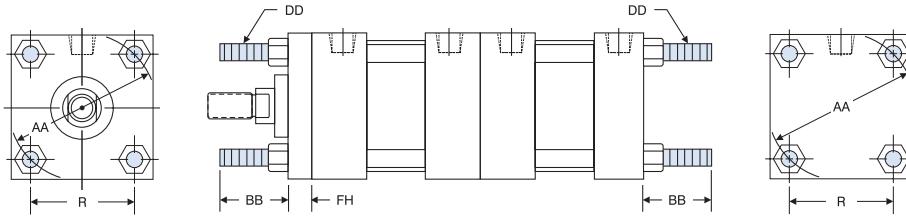
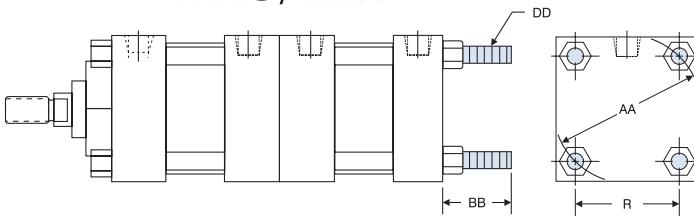
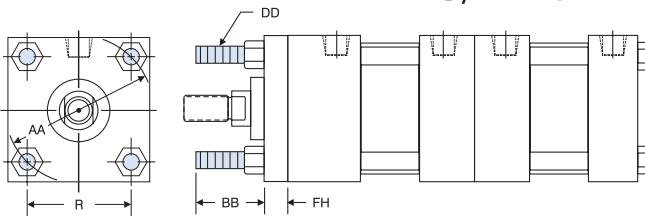


MT1 / MT2

Note: MT1 and MT2 Trunnions are bolt on, non-removable design.
Optional: One-piece solid steel trunnion available.

BORE	ROD DIAMETER	'MT1' HEAD TRUNNION AND 'MT2' CAP TRUNNION MOUNT DIMENSIONS						ADD STROKE	
		E	TD	TL	UT	XG	XJO		
1.50	.63 Standard	2	1	1	4			1.75	8.25
	1 Oversize							N/A*	8.63
2	.63 Standard	2.50	1	1	4.50			1.75	8.25
	1 Oversize							2.13	8.63
2.50	.63 Standard	3	1	1	5			1.75	8.50
	1 Oversize							2.13	8.88
3.25	1 Standard	3.75	1	1	5.75			2.25	9.75
	1.38 Oversize							2.50	10
4	1 Standard	4.50	1	1	6.50			2.25	9.75
	1.38 Oversize							2.50	10
5	1 Standard	5.50	1	1	7.50			2.25	10.25
	1.38 Oversize							2.50	10.50
6	1.38 Standard	6.50	1.38	1.38	9.25			2.63	11.38
	1.75 Oversize							2.88	11.63
8	1.38 Standard	8.50	1.38	1.38	11.25			2.63	11.63
	1.75 Oversize							2.88	11.88

*No oversize rod available on 1.50" bore MT1.

3-POSITION DIMENSIONS: TIE ROD & FLANGE MOUNTS**MX1****MXO/MX2****MX3/MXO****TIE ROD EXTENDED 'MX1', 'MX2' & 'MX3' MOUNT DIMENSIONS**

BORE	ROD DIAMETER	AA	BB	DD	FH	R
1.50	.63 Standard	2.02	1	.25-28	.38	1.43
	1 Oversize					
2	.63 Standard	2.6	1.13	.31-24	.38	1.84
	1 Oversize					
2.50	.63 Standard	3.1	1.13	.31-24	.38	2.19
	1 Oversize					
3.25	1 Standard	3.9	1.38	.38-24	.63	2.76
	1.38 Oversize					

*MX1 & MX3 have full square bushing retainer on 1.50" - 6" bores, round retainers on 8" bores.

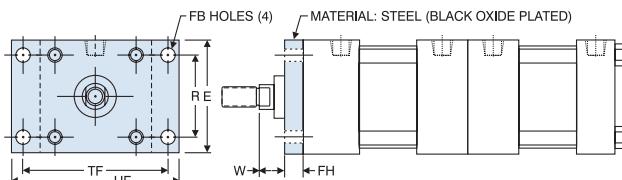
**BB dimension from head on 8" bore.

TIE ROD EXTENDED 'MX1', 'MX2' & 'MX3' MOUNT DIMENSIONS

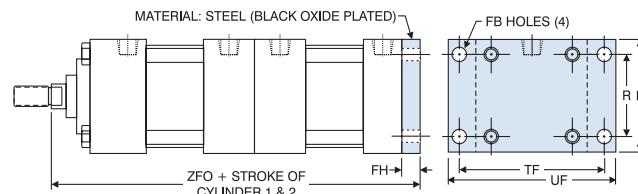
BORE	ROD DIAMETER	AA	BB	DD	FH	R
4	1 Standard	4.7	1.38	.38-24	.63	3.32
	1.38 Oversize					
5	1 Standard	5.8	1.81	.50-20	.63	4.10
	1.38 Oversize					
6	1.38 Standard	6.9	1.81	.50-20	.75	4.88
	1.75 Oversize					
8	1.38 Standard	9.1	**2.31	.63-18	*.63	6.44
	1.75 Oversize					

MF1/MXO

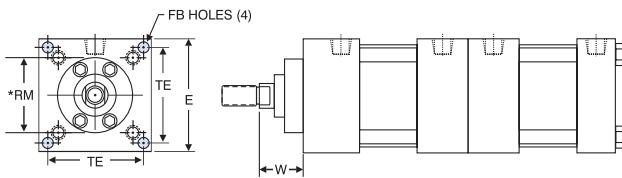
(1.50" - 6" BORES)

**MXO/MF2**

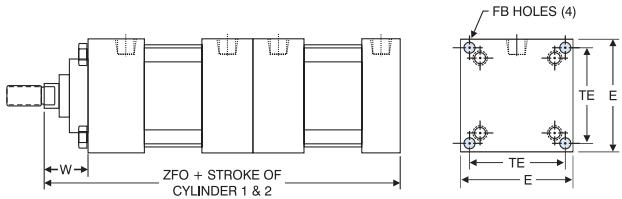
(1.50" - 6" BORES)

**ME3/MXO**

(8" BORE ONLY)

**MXO/ME4**

(8" BORE ONLY)

**'MF1', 'MF2' FLANGE & 'ME3', 'ME4' CAP MOUNT DIMENSIONS**

BORE	ROD DIAMETER	E	FB	FH	R	RM	TE	TF	UF	W	ZFO
1.50	.63 Standard	2	.31	.38	1.43	—	—	2.75	3.38	.63	9.13
	1 Oversize										
2	.63 Standard	2.50	.38	.38	1.84	—	—	3.38	4.13	.63	9.13
	1 Oversize										
2.50	.63 Standard	3	.38	.38	2.19	—	—	3.88	4.63	.63	9.38
	1 Oversize										
3.25	1 Standard	3.75	.44	.63	2.76	—	—	4.69	5.50	.75	11
	1.38 Oversize										

'MF1D' FLANGE & 'ME3D' CAP MOUNT DIMENSIONS

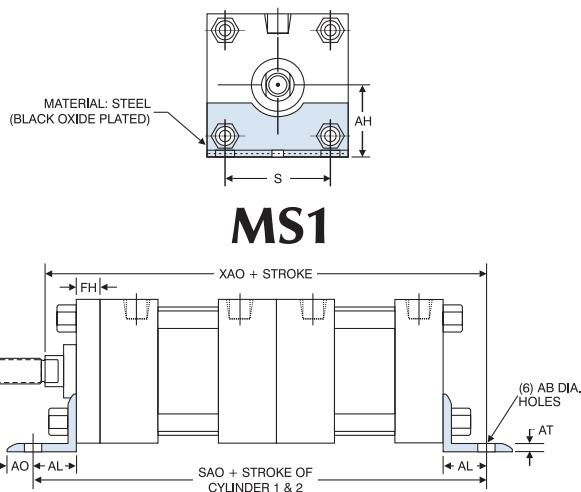
BORE	ROD DIAMETER	E	FB	FH	R	RM	TE	TF	UF	W	ZFO
4	1 Standard	4.50	.44	.63	3.32	—	—	5.44	6.25	.75	11
	1.38 Oversize										
5	1 Standard	5.50	.56	.63	4.10	—	—	6.63	7.63	.75	11.50
	1.38 Oversize										
6	1.38 Standard	6.50	.56	.75	4.88	—	—	7.63	8.63	.88	12.88
	1.75 Oversize										
8	1.38 Standard	8.50	.69	N/A	N/A	*3.50	7.57	N/A	N/A	1.63	12.38
	1.75 Oversize										

*Round retainer used to retain bushing, not a rectangle flange plate as other bores.

3-POSITION DIMENSIONS: BASE MOUNTS

'MS1' ANGLE MOUNT DIMENSIONS												
BORE	ROD DIAMETER							ADD STROKE			SAO	XAO
		AB	AH	AL	AO	AT	FH	S	SAO	XAO		
1.50	.63 Standard	.44	1.19	1	.38	.13	.38	1.25	10.13	9.75	10.13	
	1 Oversize											
2	.63 Standard	.44	1.44	1	.38	.13	.38	1.75	10.13	9.75	10.13	
	1 Oversize											
2.50	.63 Standard	.44	1.63	1	.38	.13	.38	2.25	10.38	10	10.38	
	1 Oversize											
3.25	1 Standard	.56	1.94	1.25	.50	.13	.63	2.75	12.13	11.63	11.88	
	1.38 Oversize											
4	1 Standard	.56	2.25	1.25	.50	.13	.63	3.50	12.13	11.63	11.88	
	1.38 Oversize											
5	1 Standard	.69	2.75	1.38	.63	.19	.63	4.25	12.88	12.25	12.50	
	1.38 Oversize											
6	1.38 Standard	.81	3.25	1.38	.63	.19	.75	5.25	14	13.50	13.75	
	1.75 Oversize											
8	1.38 Standard	.81	4.25	1.81	.69	.25	.63*	7.13	14.38	14.19	14.44	
	1.75 Oversize											

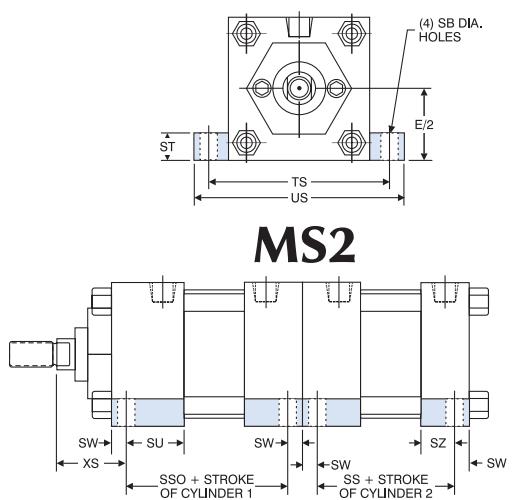
*Round retainer on 8" bore.



'MS2' SIDE LUG MOUNT DIMENSIONS												
BORE	ROD DIAMETER							ADD STROKE			SSO	SS
		SB	E/2	ST	SU	SW	SZ	TS	US	XS		
1.50	.63 Standard	.44	1	.50	1.13	.38	.63	2.75	3.50	1.38	3.38	2.88
	1 Oversize											
2	.63 Standard	.44	1.25	.50	1.13	.38	.63	3.25	4	1.38	3.38	2.88
	1 Oversize											
2.50	.63 Standard	.44	1.50	.50	1.13	.38	.63	3.75	4.50	1.38	3.50	3
	1 Oversize											
3.25	1 Standard	.56	1.88	.75	1.25	.50	.75	4.75	5.75	1.88	3.75	3.25
	1.38 Oversize											
4	1 Standard	.56	2.25	.75	1.25	.50	.75	5.50	6.50	1.88	3.75	3.25
	1.38 Oversize											
5	1 Standard	.81	2.75	1	1.06	.69	.56	6.88	8.25	2.06	3.63	3.13
	1.38 Oversize											
6	1.38 Standard	.81	3.25	1	1.31	.69	.81	7.88	9.25	2.31	4.13	3.63
	1.75 Oversize											
8	1.38 Standard	.81	4.25	1	1.31	.69	.81	9.88	11.25	2.31	4.25	3.75
	1.75 Oversize											

Note: The option not to have side lugs on center (2) caps is available. Use the "XX" option in the "How To Order" section (specify).

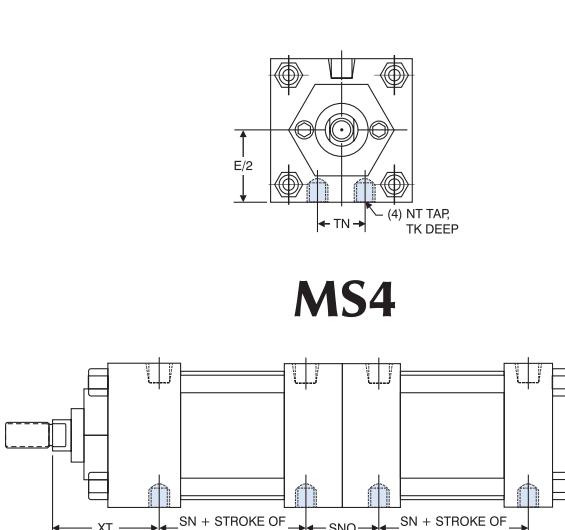
Example: 3P-TA-MS2-4 X 5-MPR with TA-MS2-4 X 3-BP-“XX”
“XX” = No side lugs on center (2) caps



'MS4' BOTTOM TAPPED MOUNT DIMENSIONS												
BORE	ROD DIAMETER							ADD STROKE			SN	SN
		E/2	NT	TK	TN	XT	SNO	SN	SN	SN		
1.50	.63 Standard	1	.25-20	.38	.63	1.94	1.88	2.25	2.31	2.31	2.31	2.31
	1 Oversize											
2	.63 Standard	1.25	.31-18	.50	.88	1.94	1.88	2.25	2.31	2.31	2.31	2.31
	1 Oversize											
2.50	.63 Standard	1.50	.38-16	.63	1.25	1.94	1.88	2.38	2.31	2.31	2.31	2.31
	1 Oversize											
3.25	1 Standard	1.88	.50-13	.75	1.50	2.44	2.13	2.63	2.69	2.69	2.69	2.69
	1.38 Oversize											
4	1 Standard	2.25	.50-13	.75	2.06	2.44	2.13	2.63	2.69	2.69	2.69	2.69
	1.38 Oversize											
5	1 Standard	2.75	.63-11	1	2.69	2.44	2.13	2.88	2.69	2.69	2.69	2.69
	1.38 Oversize											
6	1.38 Standard	3.25	.75-10	1.13	3.25	2.81	2.38	3.13	3.06	3.06	3.06	3.06
	1.75 Oversize											
8	1.38 Standard	4.25	.75-10	1.13	4.50	2.81	2.38	3.25	3.06	3.06	3.06	3.06
	1.75 Oversize											

Note: The option not to have 'MS4' taps on center (2) caps is available. Use the "XX" option in the "How To Order" section (specify).

Example: 3P-TA-MS4-6 X 7-H with TA-MS4-6 X 4-C-“XX”
“XX” = No 'MS4' taps on center (2) caps



3-POSITION CYLINDERS: DESIGN TIPS & SCHEMATIC

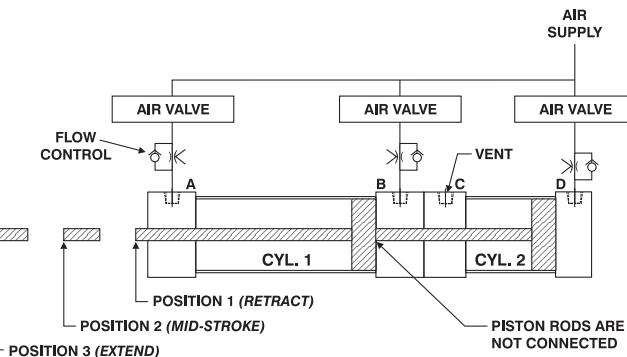
Design Tips

- Order CYL 1 with "MPR" (magnetic piston option) and use (3) switches to sense each stroke position. See pages 107-113 for switch ordering information.
- You can use "MA" (micro-adjust option) on CYL 2 to create an adjustable mid-stroke position cylinder.
- During the mid-stroke position, the piston rod on CYL 1 is held in place by seal friction and can "extend" in vertical applications when the cylinder rod end is mounted down. To prevent this from happening, a lower air pressure can be applied to cylinder port "A" to offset cylinder rod or tooling weight. See your local TRD distributor for help in designing an air circuit that's right for your application.
- For non-rotating applications, you can use a "NR" (non-rotating) or "TR" (triple rod) Series cylinder as CYL 1 and a standard "TA" Series as CYL 2.

3-POSITION CYLINDER SCHEMATIC

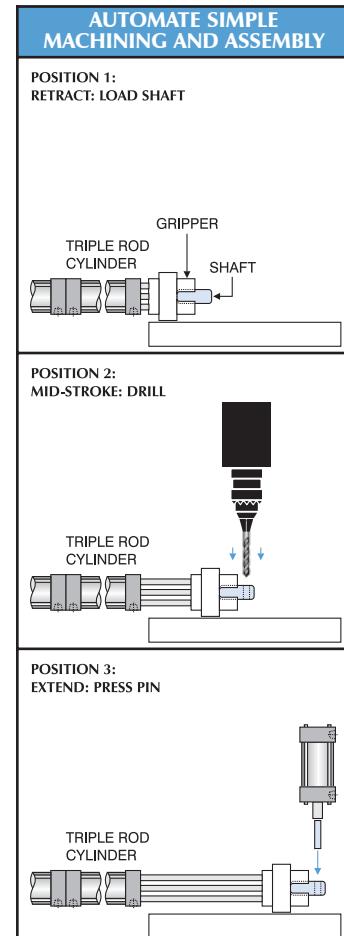
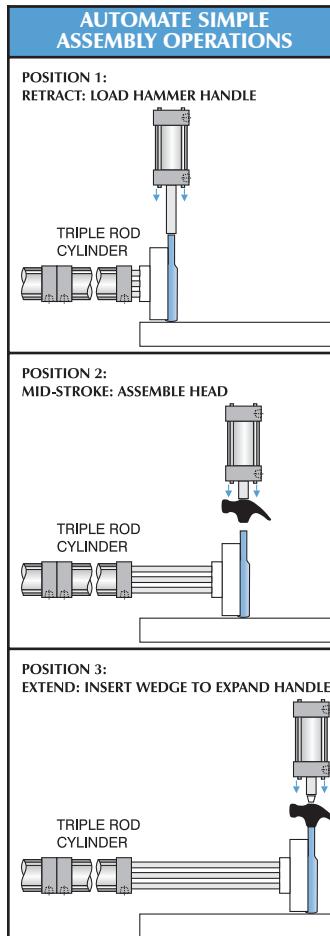
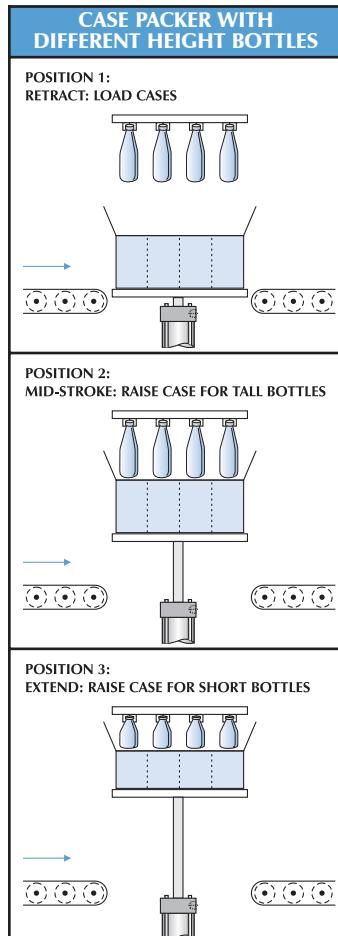
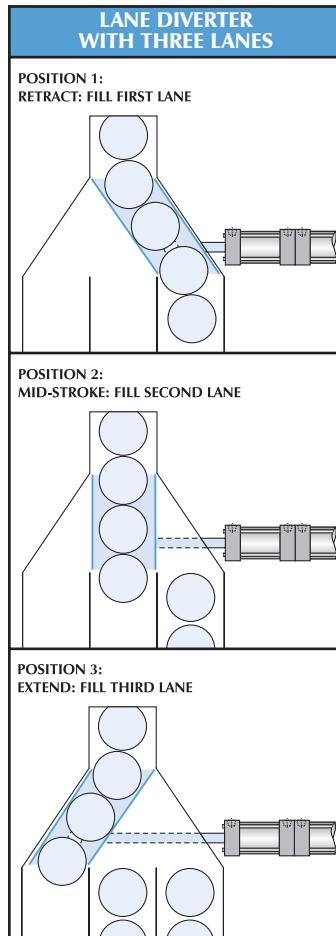
ACTUATION SEQUENCE:

PRESSURE TO PORT 'A' RETRACTS THE CYLINDER TO POSITION 1
 PRESSURE TO PORT 'D' EXTENDS THE CYLINDER TO POSITION 2
 PRESSURE TO PORT 'B' EXTENDS THE CYLINDER TO POSITION 3



The above basic schematic demonstrates how (3) 3-way air solenoid valves and flow controls can operate a 3-position cylinder. See your local TRD distributor for help in designing an air circuit that's right for your application.

Application Possibilities:



ACCESSORIES: ALIGNMENT COUPLERS

Solid Steel self-aligning piston rod couplers

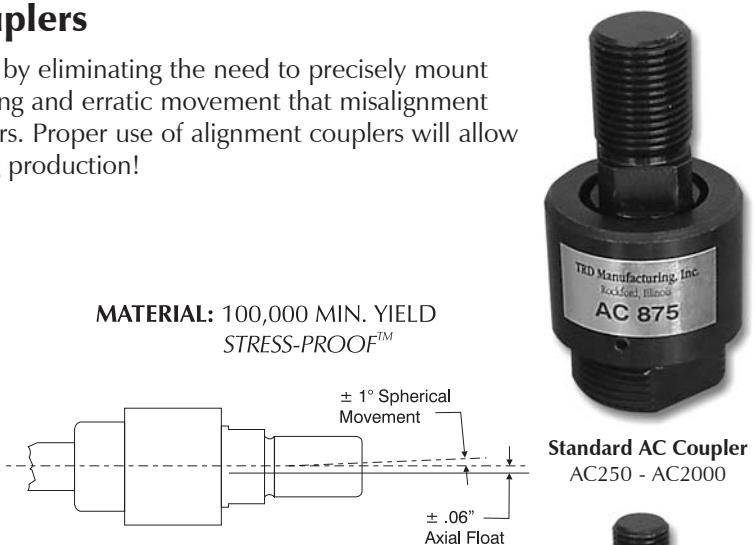
TRD's alignment couplers can virtually pay for themselves by eliminating the need to precisely mount cylinders in your applications. Our couplers prevent binding and erratic movement that misalignment causes, extending the bearing and seal life of your cylinders. Proper use of alignment couplers will allow cylinders to stroke in the shortest time possible, increasing production!

Benefits

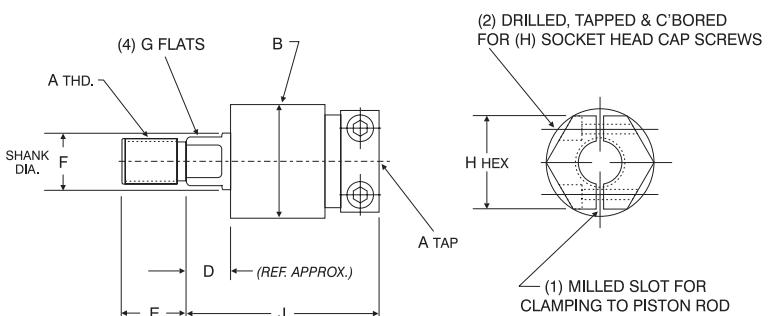
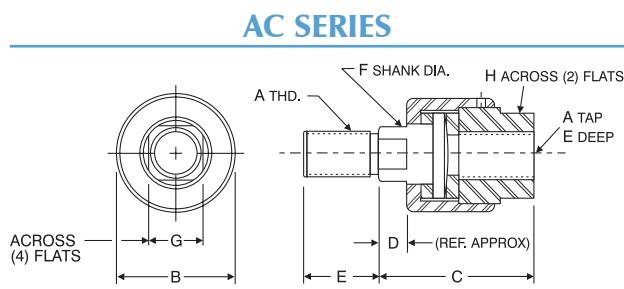
- Rod alignment couplers eliminate expensive machining for mounting fixed or rigid cylinders on guided or slide applications.
- Cylinder efficiency is increased by eliminating friction caused by misalignment. Couplers compensate for 1° angular error and .06" lateral misalignment on push or pull strokes.
- Couplers provide greater reliability, performance, and reduce cylinder component wear.
- Simplifies alignment problems in the field.

Design Tips

- Alignment couplers can be exposed to high stresses that are not apparent in an application. Always use the largest thread size practical in your application. (see chart for maximum pull yields)
- Use jam nut to lock coupler to rod when used with full diameter threads (example: .63" thread on .63" rod).
- Large thread sizes can be "pinned" in high impact applications, eliminating unwanted loosening of coupler from rod. Always use the smallest pin possible to avoid weakening the piston rod thread. (example: Use a .09" diameter pin for .63" rod threads and larger)



ACH SERIES



ALIGNMENT COUPLER DIMENSIONS											
PART NO.	A	B	C	D	E	F	G	H	H HEX	J	MAX PULL AT YIELD
AC250	.25-28	1.13	1.75	.38	.50	.50	.38	.69	1.25	2	6,000
AC312	.31-24	1.13	1.75	.38	.50	.50	.38	.69	1.25	2	8,300
AC375	.38-24	1.13	1.75	.38	.50	.50	.38	.69	1.25	2	8,300
AC437	.44-20	1.25	2	.44	.75	.63	.50	.81	1.25	2.16	10,000
AC500	.50-20	1.25	2	.44	.75	.63	.50	.81	1.13	2.16	14,000
AC625	.63-18	1.25	2	.44	.75	.63	.50	.81	1.25	2.16	19,000
AC750	.75-16	1.75	2.31	.44	1.13	.97	.81	1.13	1.75	2.50	34,000
AC875	.88-14	1.75	2.31	.44	1.13	.97	.81	1.13	1.75	2.50	39,000
AC1000	1-14	2.50	2.94	.44	1.63	1.34	1.16	1.63	2.50	2.94	64,000
AC1250	1.25-12	2.50	2.94	.44	1.63	1.34	1.16	1.63	2.50	2.94	78,000
AC1375	1.38-12	2.50	2.94	.44	1.63	1.34	1.16	1.63	—	—	78,000
AC1500	1.50-12	3.25	4.38	.88	2.25	1.97	1.75	2.38	—	—	134,000
AC1750	1.75-12	3.25	4.38	.88	2.25	1.97	1.75	2.38	—	—	134,000
AC1875	1.88-12	3.75	5.63	1	3	2.47	2.13	2.75	—	—	134,000
AC2000	2-12	3.75	5.63	1	3	2.47	2.13	2.75	—	—	195,000

*Please specify AC or ACH coupler when ordering:
i.e.: AC750 (Std. Coupler) or ACH750 (Hex Coupler)

How to Order:		(Optional alternative size*)									
AC	250	- 312 FEMALE									
SERIES	SIZE										
AC	250										
ACH	312										
	375										
	437										
	500										
	625										
	750										
	875										
	1000										
	1250										
	1375										
	1500										
	1750										

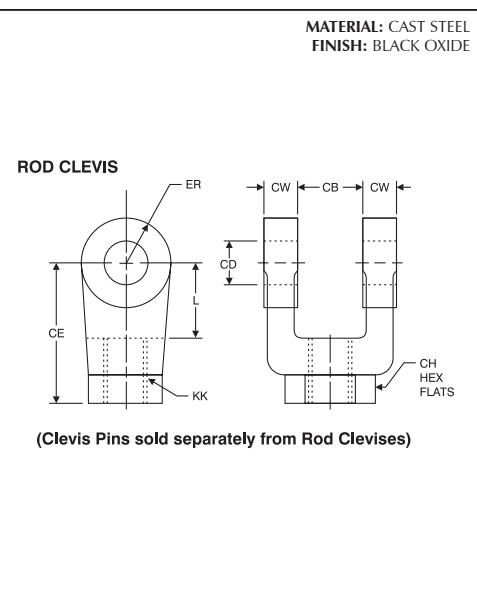
*You can order different thread sizes within the same size of coupler housing DIA. (Refer to "B" Diameter in dimension chart)

Ordering Examples:

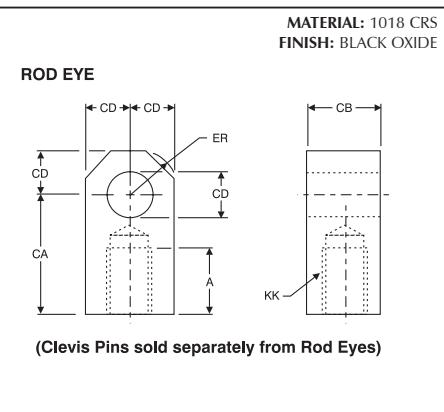
- AC250 (AC with male & female .25-28 thread)
ACH500 (ACH with male & female .50-20 thread)
AC437-625 FEMALE (AC with .44-20 male and .63-18 female thread)

Accessories: Clevis, Pins & Mounts

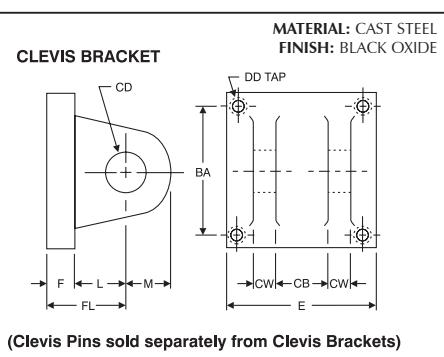
ROD CLEVIS								
PART NO.	CB	CD	CE	CH	CW	ER	KK	L
RC437	.75	.50	1.50	1	.50	.50	.44-20	.75
RC500							.50-20	
RC750	1.25	.75	2.38	1.25	.63	.75	.75-16	1.25
RC1000	1.50	1	3.13	1.50	.75	1	1-14	1.50
RC1250	2	1.38	4.13	2	1	1.38	1.25-12	2.13
RC1375	2	1.38	4.13	2	1	1.38	1.38-12	2.13
RC1500	2.50	1.75	4.50	2.38	1.25	1.75	1.50-12	2.25
RC1750	2.50	1.75	4.50	2.38	1.25	1.75	1.75-12	2.25
RC1875	2.50	2	5.50	3	1.25	2	1.88-12	2.50



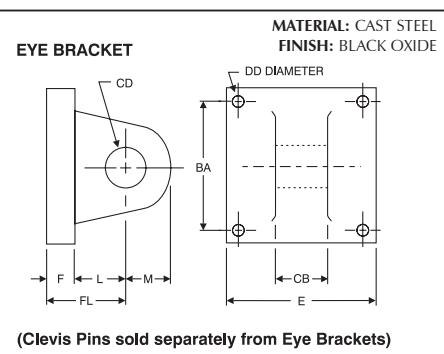
ROD EYE						
PART NO.	A	CA	CB	CD	ER	KK
RE437	.75	1.50	.75	.50	.63	.44-20
RE500						.50-20
RE750	1.13	2.06	1.25	.75	.88	.75-16
RE1000	1.63	2.81	1.50	1	1.19	1-14
RE1250	2	3.44	2	1.38	1.56	1.25-12
RE1500	2.25	4	2.50	1.75	2	1.50-12



CLEVIS BRACKET										
PART NO.	BA	CB	CD	CW	DD	E	F	FL	L	M
CB500	1.63	.75	.50	.50	.38-24	2.50	.38	1.13	.75	.50
CB750	2.56	1.25	.75	.63	.50-20	3.50	.63	1.88	1.25	.75
CB1000	3.25	1.50	1	.75	.63-18	4.50	.75	2.25	1.50	1
CB1375	3.81	2	1.38	1	.63-18	5	.88	3	2.13	1.38
CB1750	4.94	2.50	1.75	1.25	.88-14	6.50	.88	3.13	2.25	1.75

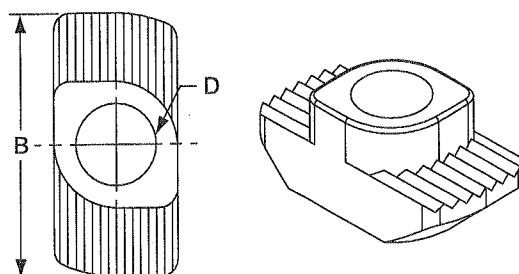
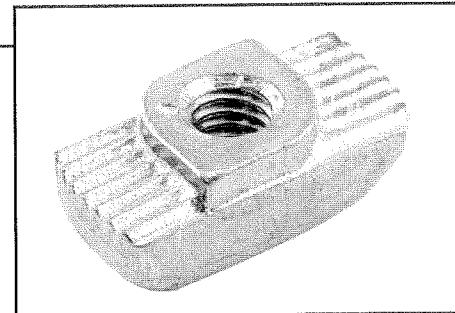
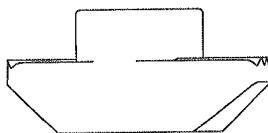
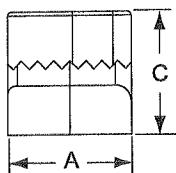


EYE BRACKET									
PART NO.	BA	CB	CD	DD	E	F	FL	L	M
EB500	1.63	.75	.50	.41	2.50	.38	1.13	.75	.50
EB750	2.56	1.25	.75	.53	3.50	.63	1.88	1.25	.75
EB1000	3.25	1.50	1	.66	4.50	.75	2.25	1.50	1
EB1375	3.81	2	1.38	.66	5	.88	3	2.13	1.38
EB1750	4.95	2.50	1.75	.91	6.50	.88	3.13	2.25	1.75



Fractional

Drop-In T-Nuts



- 10, 15, 25 and 40 Series compatible
- Loads into the profile T-slot when ends are captivated
- Ridges bite into the profile surface maximizing the connection

Part No.	Material	A	B	C	D (Thread)	Lbs.	Compatibility Code*			
3930	Zinc-Plated Steel	.310	.625	.250	M5	.007	8-15			
3931					M6	.007				
3932					10-32	.007	8-40			
3933					1/4-20	.007				
14162	Steel	.224	.453	.165	10-32	.003	6-10 6-25			
14164	Stainless Steel				M4	.003				
14166					M4	.003				
13114	Zinc-Plated Steel	.303	.630	.295	M4	.010	8-15			
13116					M5	.008				
13119					M6	.007	8-40			
14165					1/4-20	.007				

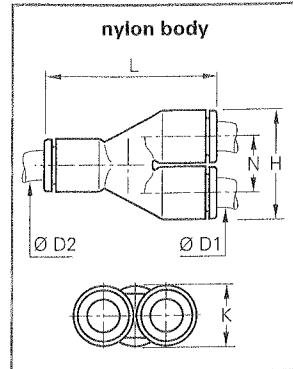
* See Compatibility Code information on page 152.

CUSTOMIZE YOUR PROJECT WITH ANY OF THESE 80/20® ACCESSORIES

- End Caps - Pg. 436
- Cart Guard® - Pg. 444-445
- Tube Clamps - Pg. 440 & 450
- Document Holders - Pg. 449
- Custom designs to fit your space constraints
- Workstation & desk components to meet the demands of the job at hand
- Aesthetically pleasing
- End or side mounts for manifold plates, even CUSTOM plates (our specialty)
- Accessories to compliment your design even more
- COLORS! COLORS! COLORS!
- One-Stop Shopping!...only at 80/20
- T-Slot Covers - Pg. 437
- AkroBins® - Pg. 446
- Wiring Duct - Pg. 439
- Pressure Manifolds - Pg. 451-453
- Table Tops - Pg. 443
- Bumpers - Pg. 448
- Tool Hangers - Pg. 447

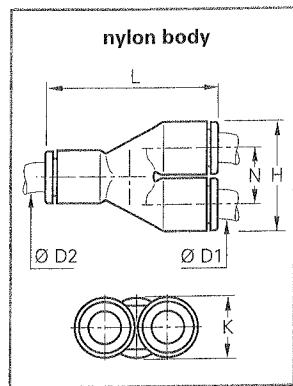
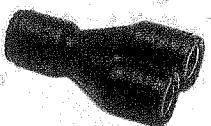
union "Y"— tube to tube

3140 "Y" — fractional inch tube to tube



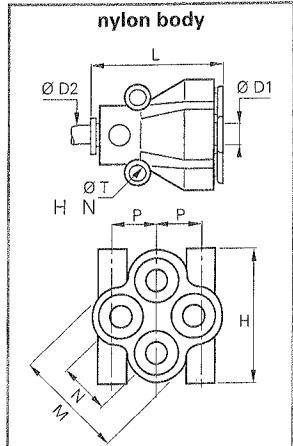
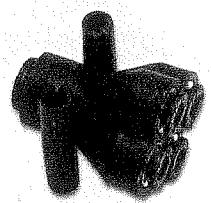
$\varnothing D1$	$\varnothing D2$		H	K	L	N	Δoz
in	in		in	in	in	in	
1/8	1/8	3140 53 00	.69	.33	1.12	.35	.16
5/32	5/32	3140 04 00	.69	.34	1.12	.35	.14
3/16	3/16	3140 55 00	.87	.34	1.77	.45	.10
1/4	1/4	3140 56 00	.87	.43	1.42	.45	.24
5/16	5/16	3140 08 00	1.10	.53	1.77	.57	.46
3/8	3/8	3140 60 00	1.30	.63	2.09	.67	.59
1/8	1/4	3140 53 56	.87	.43	1.42	.45	.20
5/32	1/4	3140 04 56	.87	.43	1.42	.45	.43
1/4	3/8	3140 56 60	1.30	.63	1.31	.67	.50

3140 "Y" — metric tube to tube



$\varnothing D1$	$\varnothing D2$		H	K	L	N	Δkg
mm	mm		mm	mm	mm	mm	
4	4	3140 04 00	17.5	8.5	28.5	9	.004
6	6	3140 06 00	21.5	10.5	35	11	.007
8	8	3140 08 00	28	13.5	45	14.5	.013
10	10	3140 10 00	33	16	53	17	.020
12	12	3140 12 00	39	19	57	20	.025
4	6	3140 04 06	17.5	10.5	33	9	.005
6	8	3140 06 08	22.5	13.5	41	11.5	.019
8	10	3140 08 10	28	16	47	14.5	.015
10	12	3140 10 12	33	19	57	17	.022

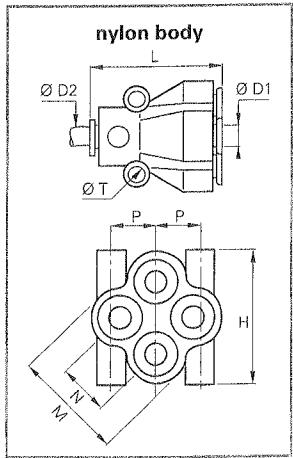
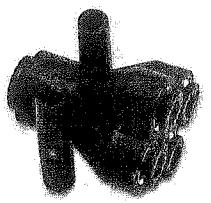
3144 double "Y" — fractional inch tube to tube



$\varnothing D1$	$\varnothing D2$		H	L	M	N	P	T	Δoz
in	in		in	in	in	in	in	in	
5/32	5/32	3144 04 04	1.00	1.20	.83	.39	.34	.15	.95
5/32	1/4	3144 04 56	1.00	1.18	.83	.39	.34	.15	.95

$\varnothing T$ = I.D. of mounting hole (see page A29)

3144 multiple "Y" — metric tube to tube



$\varnothing D1$	$\varnothing D2$		H	L	M	N	P	T	Δkg
mm	mm		mm	mm	mm	mm	mm	mm	
4	4	3144 04 04	25.5	30.5	21	10	8.5	3.7	.027
6	6	3144 06 06	31.5	37.5	26.5	12	10	3.7	.043
4	6	3144 04 06	25.5	30.5	21	10	8.5	3.7	.027
6	8	3144 06 08	31.5	38	26.5	12	10	3.7	.045

$\varnothing T$ = I.D. of mounting hole (see page A29)

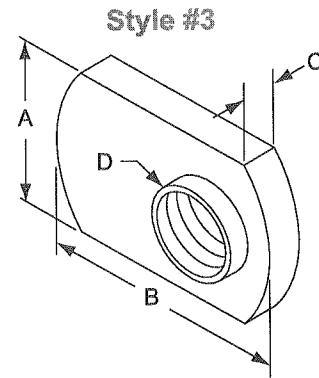
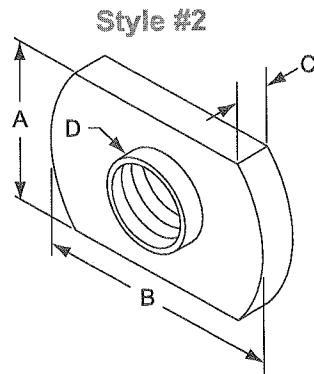
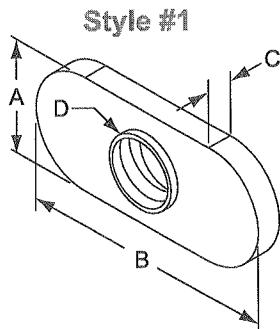
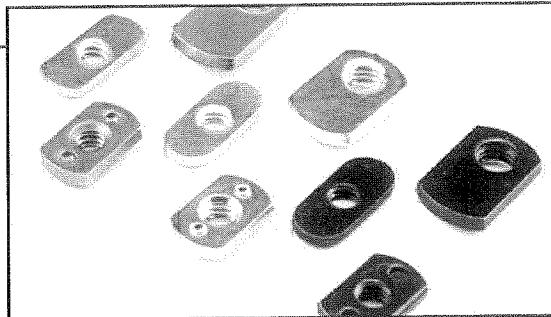
80/20® Inc.

The Industrial Erector Set®

THE STANDARD

Slide-In Economy T-Nuts

- Loads from the profile end only
- Available in stainless steel or carbon steel, black or bright zinc-plated
- Refer to pages 249-259 for our full screw and bolt offering



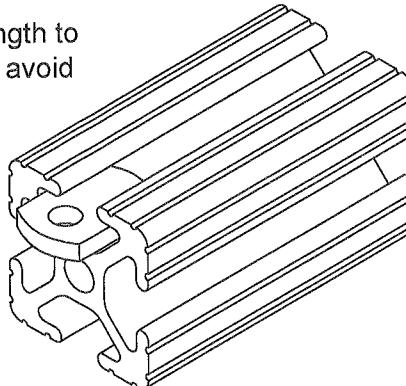
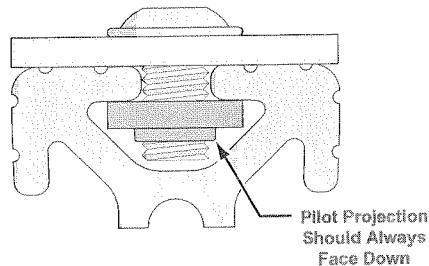
3

Part No.	Nut Style	A	B	C	D (Thread)	Finish	Lbs.
3275	Style 1	.443	.875	.094	8-32 Centered	Black Zinc	.008
3276	Style 1	.443	.875	.094	10-32 Centered	Black Zinc	.008
3675	Style 1	.443	1.000	.094	1/4-20 Centered	Stainless Steel	.009
3382	Style 1	.443	1.000	.094	1/4-20 Centered	Black Zinc	.009
3785	Style 1	.443	1.000	.094	1/4-20 Centered	Bright Zinc	.009
3859	Style 1	.443	1.000	.094	M6 x 1.0 Centered	Bright Zinc	.010
3686	Style 2	.505	.812	.125	1/4-20 Centered	Stainless Steel	.012
3286	Style 2	.505	.812	.125	1/4-20 Centered	Black Zinc	.012
3786	Style 2	.505	.812	.125	1/4-20 Centered	Bright Zinc	.012
3836	Style 2	.505	1.125	.125	M6 x 1.0 Centered	Bright Zinc	.017
3676	Style 3	.380	.625	.094	10-32 Offset	Stainless Steel	.005
3278	Style 3	.637	.984	.142	5/16-18 Offset	Black Zinc	.021
3778	Style 3	.637	.984	.142	5/16-18 Offset	Bright Zinc	.021
3838	Style 3	.630	.984	.142	M8 x 1.25 Offset	Bright Zinc	.021
3678	Style 3	.637	1.125	.142	5/16-18 Offset	Stainless Steel	.024

= 10 Series Compatible Part

Threaded Pilot Projection

The threaded pilot projection provides more thread, adding strength to the fastener. Always position the projection down in the T-slot to avoid crashing and an uneven connection.





Polyurethane Pneumatic Tubing



NITRA™ polyurethane (PUR) tubing is made from the highest quality, 100% virgin raw materials available and has a hardness specification of Shore A 98. It is ether based to provide excellent hydrolysis, oil and cold resistance. **NITRA** polyurethane tubing is strong, flexible, and offers superior kink resistance compared to other tubing. With its extremely tight outside diameter tolerance, **NITRA** polyurethane tubing is ideal for use with **NITRA** push-to-connect fittings.

Features

- Inch and metric sizes available
- Seven colors - black, blue, clear, red, yellow, clear blue, and dark green (UV stabilized)
- 100 foot and 500 foot package sizes, 100 and 250 foot package sizes for the PU16M series
- Shore A 98 hardness
- Strong, flexible and kink resistant
- Made in USA

Color Key

Standard Tubing	UV Stabilized Tubing
-----------------	----------------------

- UV stabilized tubing is excellent for outdoor use

Polyurethane 5/32 in. (4 mm) Tubing Specifications

Outside Diameter (in.)	0.156	Working Pressure (psi) @ 70°F	200	Temp. Range	-40°F to +160°F (-40°C to +71°C)	
Inside Diameter (in.)	0.093	Burst Pressure (psi)	600	Hardness	Shore A 98	
Wall Thickness (in.)	0.031	Vacuum Rating	To 28" Hg	Bend Radius (in.)	0.250	
100 ft. Package Length				500 ft. Reel Length		
Part Number	Price	Color	PKG WT (lbs)	Part Number	Price	
PU532BLK100	<--->	Black	1.0	PU532BLK500	<--->	
PU532BLU100	<--->	Blue		PU532BLU500	<--->	
PU532CLR100	<--->	Clear		PU532CLR500	<--->	
PU532CBL100	<--->	Clear Blue		PU532CBL500	<--->	
PU532RED100	<--->	Red		PU532RED500	<--->	
PU532YEL100	<--->	Yellow		PU532YEL500	<--->	
UV532GRN100	<--->	Dark Green		UV532GRN500	<--->	
4.0						

Polyurethane 1/4 in. Tubing Specifications

Outside Diameter (in.)	0.250	Working Pressure (psi) @ 70°F	180	Temp. Range	-40°F to +160°F (-40°C to +71°C)	
Inside Diameter (in.)	0.156	Burst Pressure (psi)	540	Hardness	Shore A 98	
Wall Thickness (in.)	0.047	Vacuum Rating	To 28" Hg	Bend Radius (in.)	0.476	
100 ft. Package Length				500 ft. Reel Length		
Part Number	Price	Color	PKG WT (lbs)	Part Number	Price	
PU14BLK100	<--->	Black	2.0	PU14BLK500	<--->	
PU14BLU100	<--->	Blue		PU14BLU500	<--->	
PU14CLR100	<--->	Clear		PU14CLR500	<--->	
PU14CBL100	<--->	Clear Blue		PU14CBL500	<--->	
PU14RED100	<--->	Red		PU14RED500	<--->	
PU14YEL100	<--->	Yellow		PU14YEL500	<--->	
UV14GRN100	<--->	Dark Green		UV14GRN500	<--->	
8.0						



Polyurethane Pneumatic Tubing



Company Information

Systems Overview

Programmable Controllers

Field I/O

Software

C-more & other HMI

Drives

Soft Starters

Motors & Gearbox

Steppers/ Servos

Motor Controls

Proximity Sensors

Photo Sensors

Limit Switches

Encoders

Current Sensors

Pressure Sensors

Temperature Sensors

Pushbuttons/ Lights

Process

Relays/ Timers

Comm.

Terminal Blocks & Wiring

Power

Circuit Protection

Enclosures

Tools

Pneumatics

Safety

Appendix

Product Index

Part # Index

Polyurethane 3/8 in. Tubing Specifications							
Outside Diameter (in.)		0.375	Working Pressure (psi) @ 70°F		150	Temp. Range	-40°F to +160°F (-40°C to +71°C)
Inside Diameter (in.)		0.250	Burst Pressure (psi)		450	Hardness	Shore A 98
Wall Thickness (in.)		0.063	Vacuum Rating		To 28" Hg	Bend Radius (in.)	1.00
100 ft. Package Length			500 ft. Reel Length				
Part Number	Price	Color	PKG WT (lbs)	Part Number	Price	Color	PKG WT (lbs)
PU38BLK100	<-->	Black	3.0	PU38BLK500	<-->	Black	16.0
PU38BLU100	<-->	Blue		PU38BLU500	<-->	Blue	
PU38CLR100	<-->	Clear		PU38CLR500	<-->	Clear	
PU38CBL100	<-->	Clear Blue		PU38CBL500	<-->	Clear Blue	
PU38RED100	<-->	Red		PU38RED500	<-->	Red	
PU38YEL100	<-->	Yellow		PU38YEL500	<-->	Yellow	
UV38GRN100	<-->	Dark Green		UV38GRN500	<-->	Dark Green	

Polyurethane 1/2 in. Tubing Specifications							
Outside Diameter (in.)		0.500	Working Pressure (psi) @ 70°F		150	Temp. Range	-40°F to +160°F (-40°C to +71°C)
Inside Diameter (in.)		0.328	Burst Pressure (psi)		450	Hardness	Shore A 98
Wall Thickness (in.)		0.086	Vacuum Rating		To 28" Hg	Bend Radius (in.)	1.102
100 ft. Package Length			500 ft. Reel Length				
Part Number	Price	Color	PKG WT (lbs)	Part Number	Price	Color	PKG WT (lbs)
PU12BLK100	<-->	Black	6.0	PU12BLK500	<-->	Black	29.0
PU12BLU100	<-->	Blue		PU12BLU500	<-->	Blue	
PU12CLR100	<-->	Clear		PU12CLR500	<-->	Clear	
PU12CBL100	<-->	Clear Blue		PU12CBL500	<-->	Clear Blue	
PU12RED100	<-->	Red		PU12RED500	<-->	Red	
PU12YEL100	<-->	Yellow		PU12YEL500	<-->	Yellow	
UV12GRN100	<-->	Dark Green		UV12GRN500	<-->	Dark Green	

Polyurethane 6 mm Tubing Specifications							
Outside Diameter (mm)		6.0	Working Pressure (psi) @ 70°F		180	Temp. Range	-40°F to +160°F (-40°C to +71°C)
Inside Diameter (mm)		4.0	Burst Pressure (psi)		540	Hardness	Shore A 98
Wall Thickness (mm)		1.0	Vacuum Rating		To 28" Hg	Bend Radius (mm)	12.0
100 ft. Package Length			500 ft. Reel Length				
Part Number	Price	Color	PKG WT (lbs)	Part Number	Price	Color	PKG WT (lbs)
PU6MBLK100	<-->	Black	2.0	PU6MBLK500	<-->	Black	7.0
PU6MBLU100	<-->	Blue		PU6MBLU500	<-->	Blue	
PU6MCLR100	<-->	Clear		PU6MCLR500	<-->	Clear	
PU6MCBL100	<-->	Clear Blue		PU6MCBL500	<-->	Clear Blue	
PU6MRED100	<-->	Red		PU6MRED500	<-->	Red	
PU6MYEL100	<-->	Yellow		PU6MYEL500	<-->	Yellow	
UV6MGRN100	<-->	Dark Green		UV6MGRN500	<-->	Dark Green	

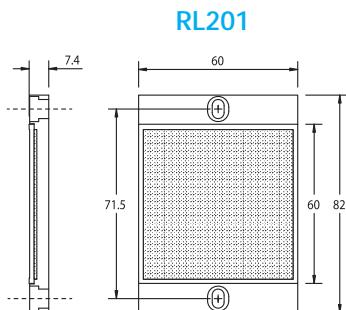
Accessories: Reflectors, Adapters & Mounting Brackets

RL series reflectors for polarized reflective Laser photoelectric sensors (FALN series)

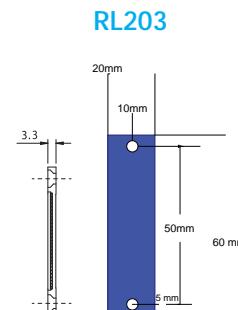
- Suitable for use with polarized light Laser photoelectric sensors
- Sizes for most applications
- Miniature types for close mounting in multiple sensor installations
- 5 reflectors per package

Specifications			
Model	RL201	RL203	RL204
Sensing Range Using FALN¹	30m	7m	7m
Dimensions	60mm x 82mm	19mm x 60mm	20mm x 32mm
Mounting	two Ø4mm holes	two Ø5mm holes	two Ø3mm holes
Degree of Protection²	IEC IP67		
Materials	Acrylic/polycarbonate		

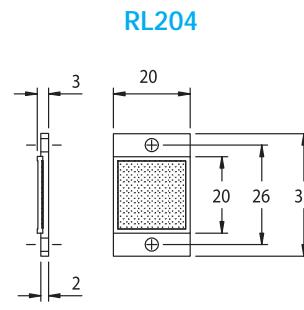
1 Refer to individual catalog pages for detailed explanations of these photoelectric sensors.
2 Not recommended for applications involving moist air environments or water immersion.
Note: All reflective sensors are shipped with an RL110 reflector. Purchase additional reflectors separately.



<--->
(5 per pack)



<--->
(5 per pack)



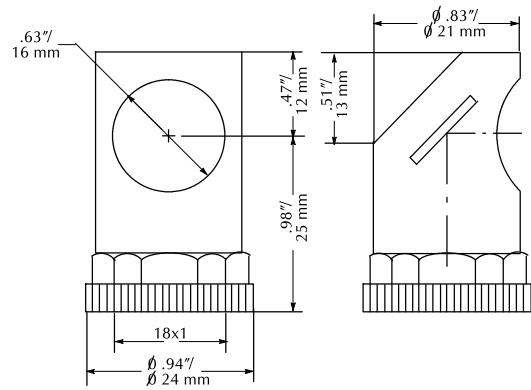
<--->
(5 per pack)

ST03 right-angle M18 (18 mm) beam adapter

For use with M18 retroreflective and through-beam photoelectric switches (not for use with diffuse reflection sensors). Allows 90° light detection using an internal mirror set at 45° to the optical axis. Sensitivity loss is about 20-30%.



<--->

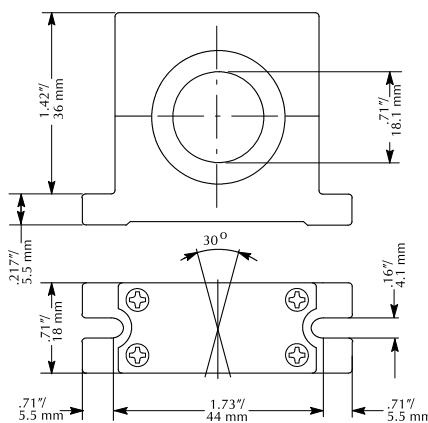


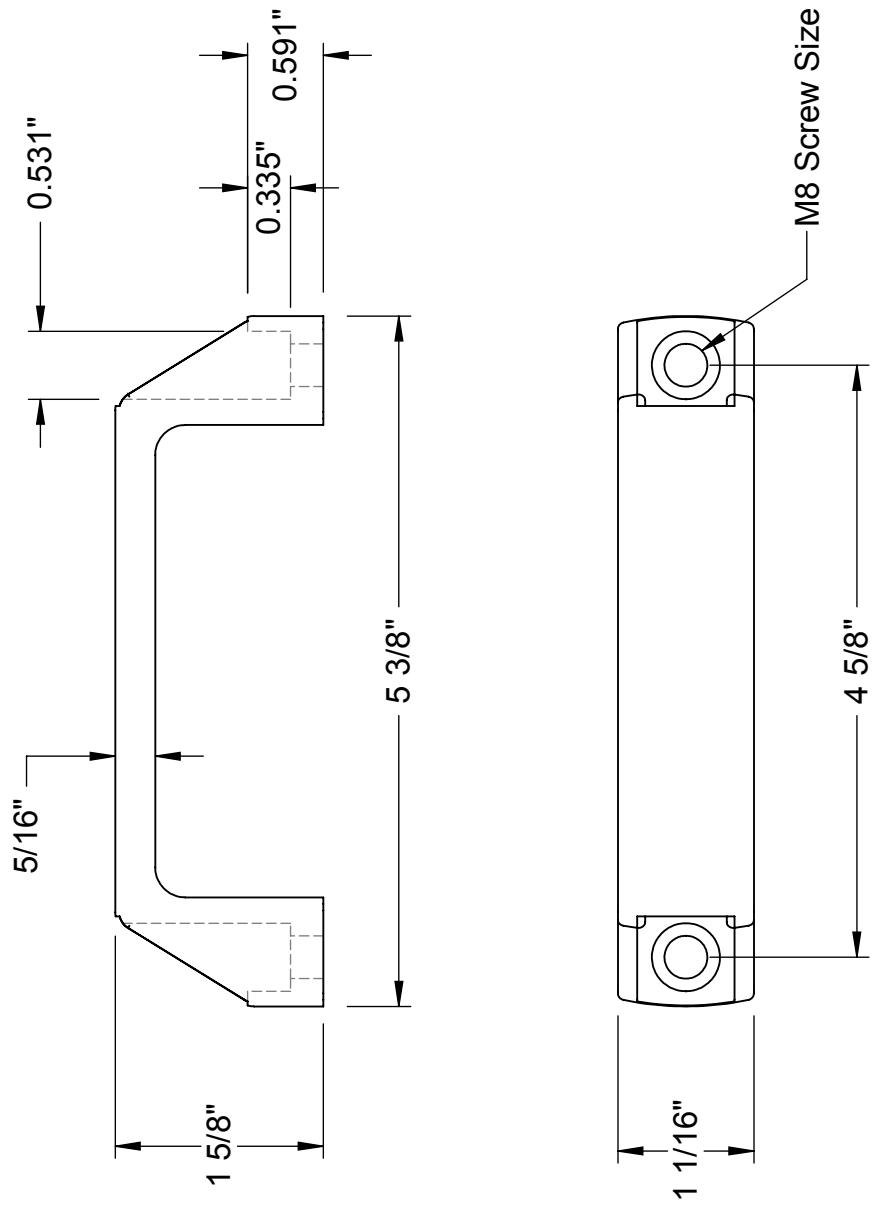
ST02 plastic swivel bracket M18 (18 mm)

Plastic mounting bracket for use with M18 photoelectric switches. Has a ball-joint and set screws to adjust sensor orientation. Allows orientation in all directions for retroreflective and through-beam sensors. (Will not work with C18 series).



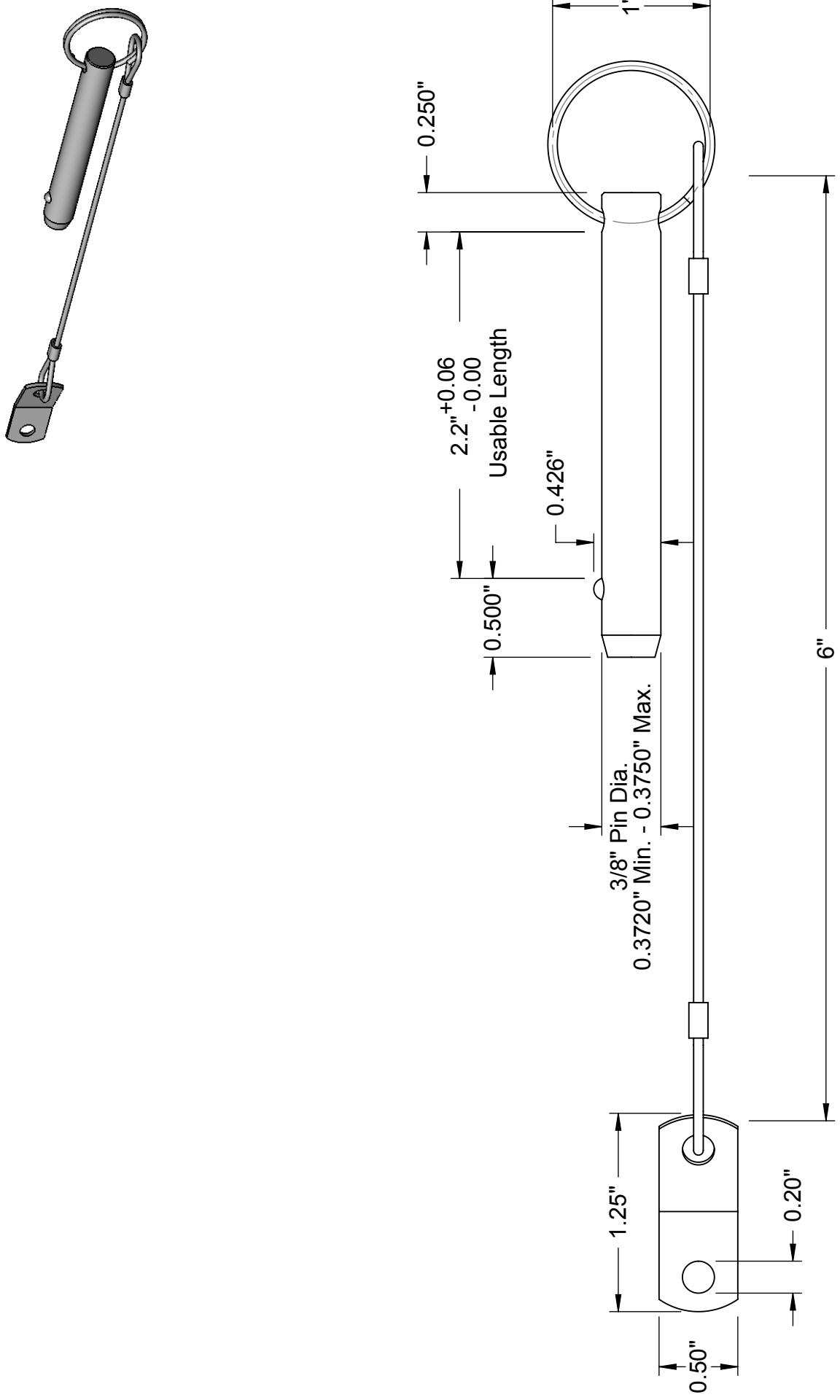
<--->





Mounting screws not included.

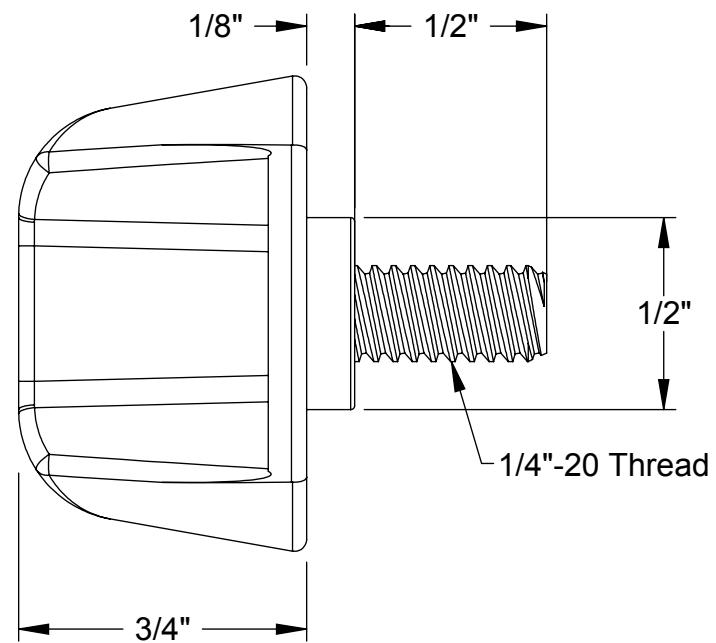
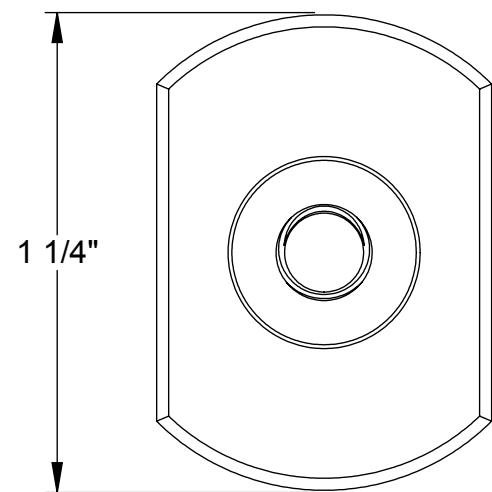
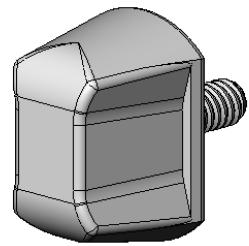
McMASTER-CARR®	PART NUMBER	1078A321
http://www.mcmaster.com	Black Plastic Pull Handle	
© 2013 McMaster-Carr Supply Company	Information in this drawing is provided for reference only.	



McMASTER-CARR® 
PART NUMBER **94975A578**

<http://www.mcmaster.com>

18-8 Stainless Steel
Quick-Release Pin with Lanyard
© 2012 McMaster-Carr Supply Company
Information in this drawing is provided for reference only.



McMASTER-CARR CAD

<http://www.mcmaster.com>

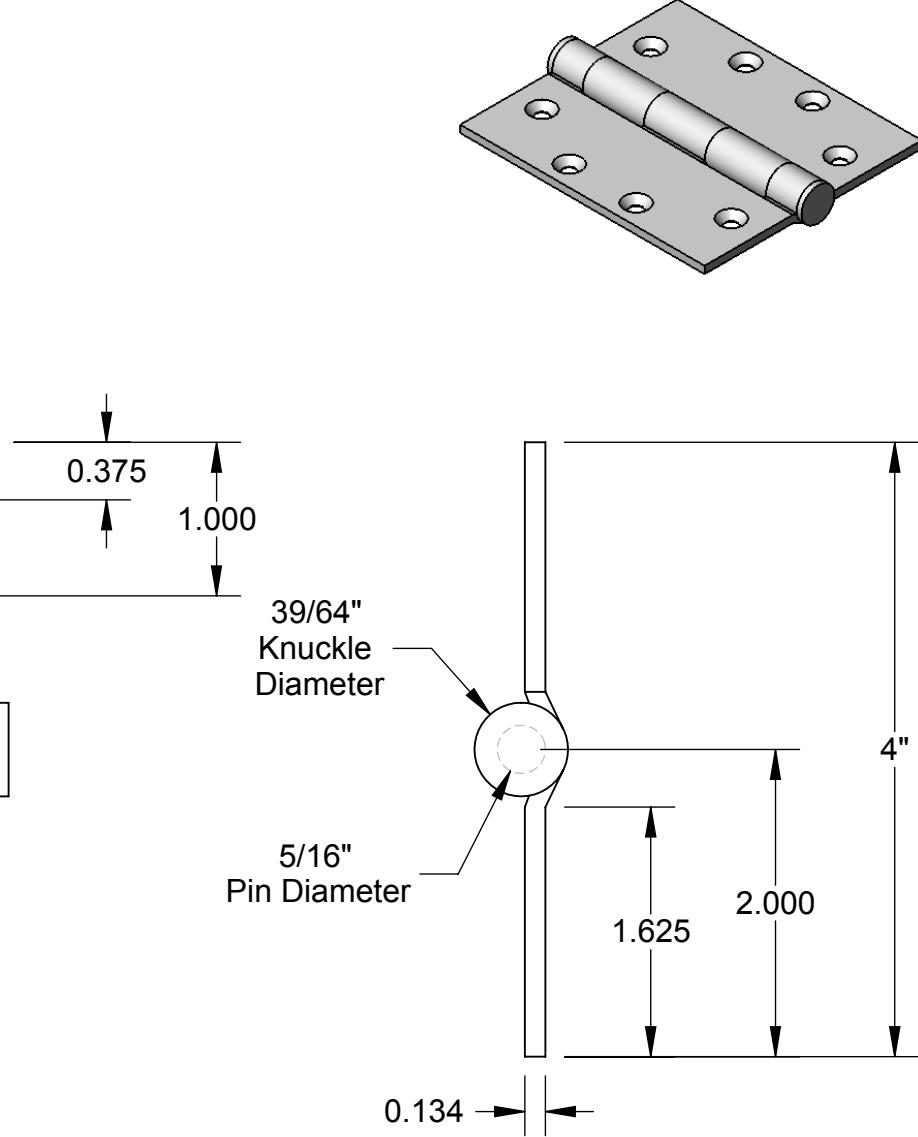
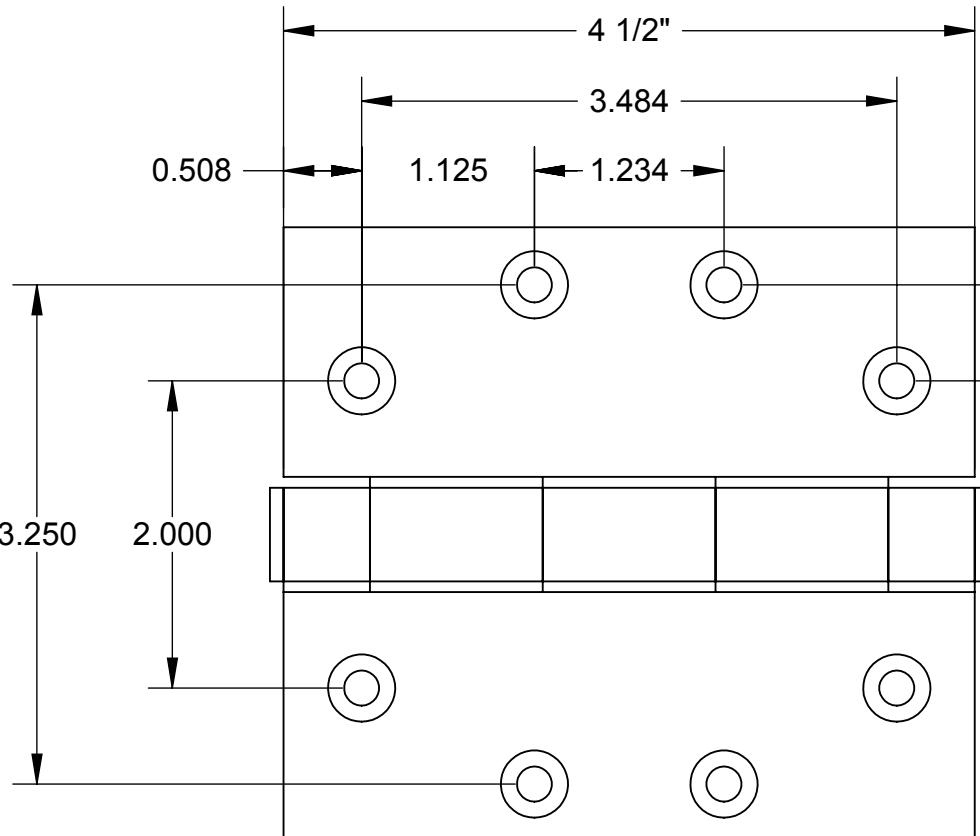
© 2010 McMaster-Carr Supply Company

Information in this drawing is provided for reference only.

PART
NUMBER

65035K39

Polypropylene Two Arm Knob
with Zinc-Plated Steel Stud



Hinge uses #12 flat head screws.
Dimensions are in inches, unless noted.

McMASTER-CARR CAD

<http://www.mcmaster.com>

© 2012 McMaster-Carr Supply Company

Information in this drawing is provided for reference only.

PART
NUMBER

1494A43

Mortise-Mount
Template Hinge