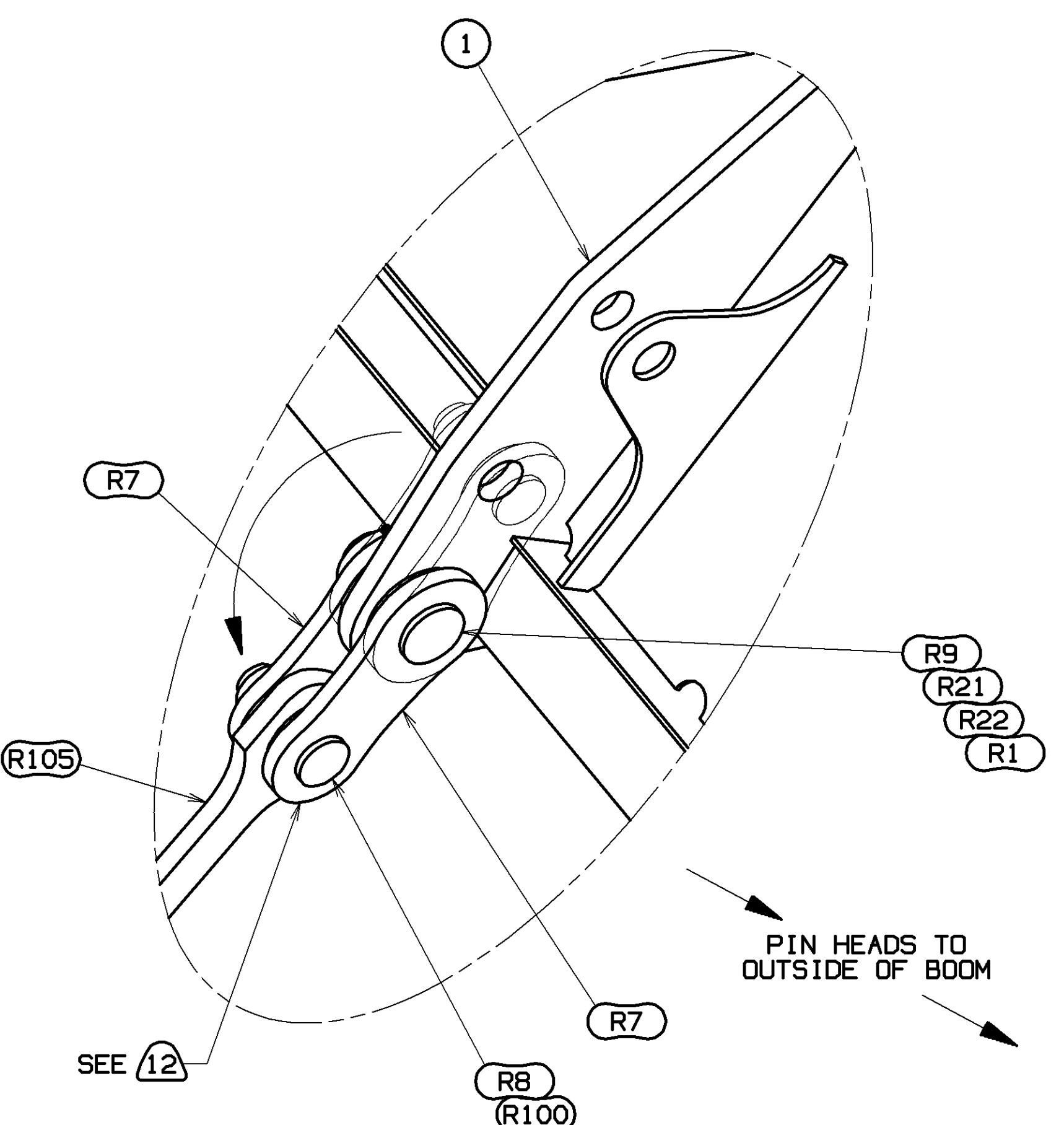
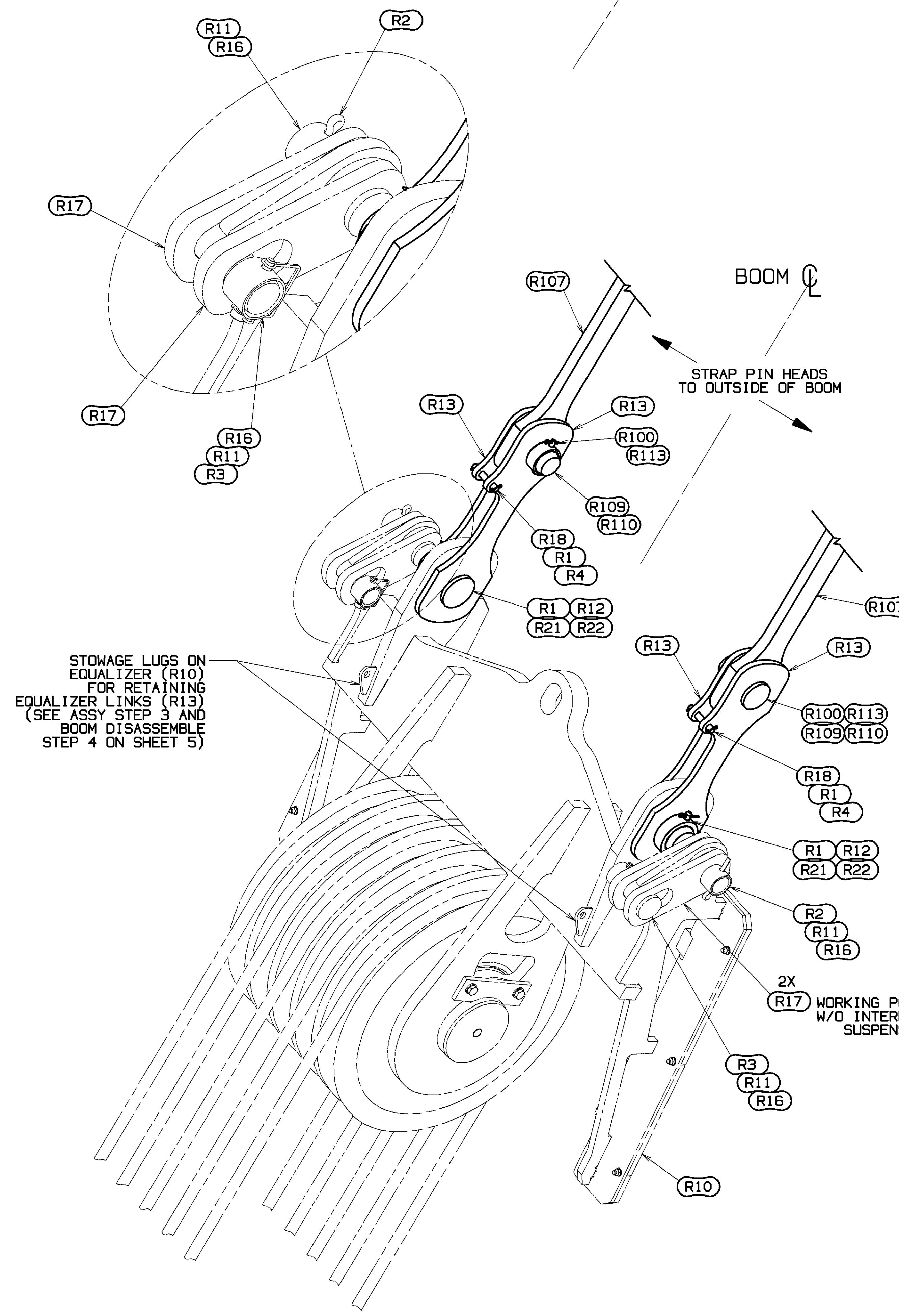


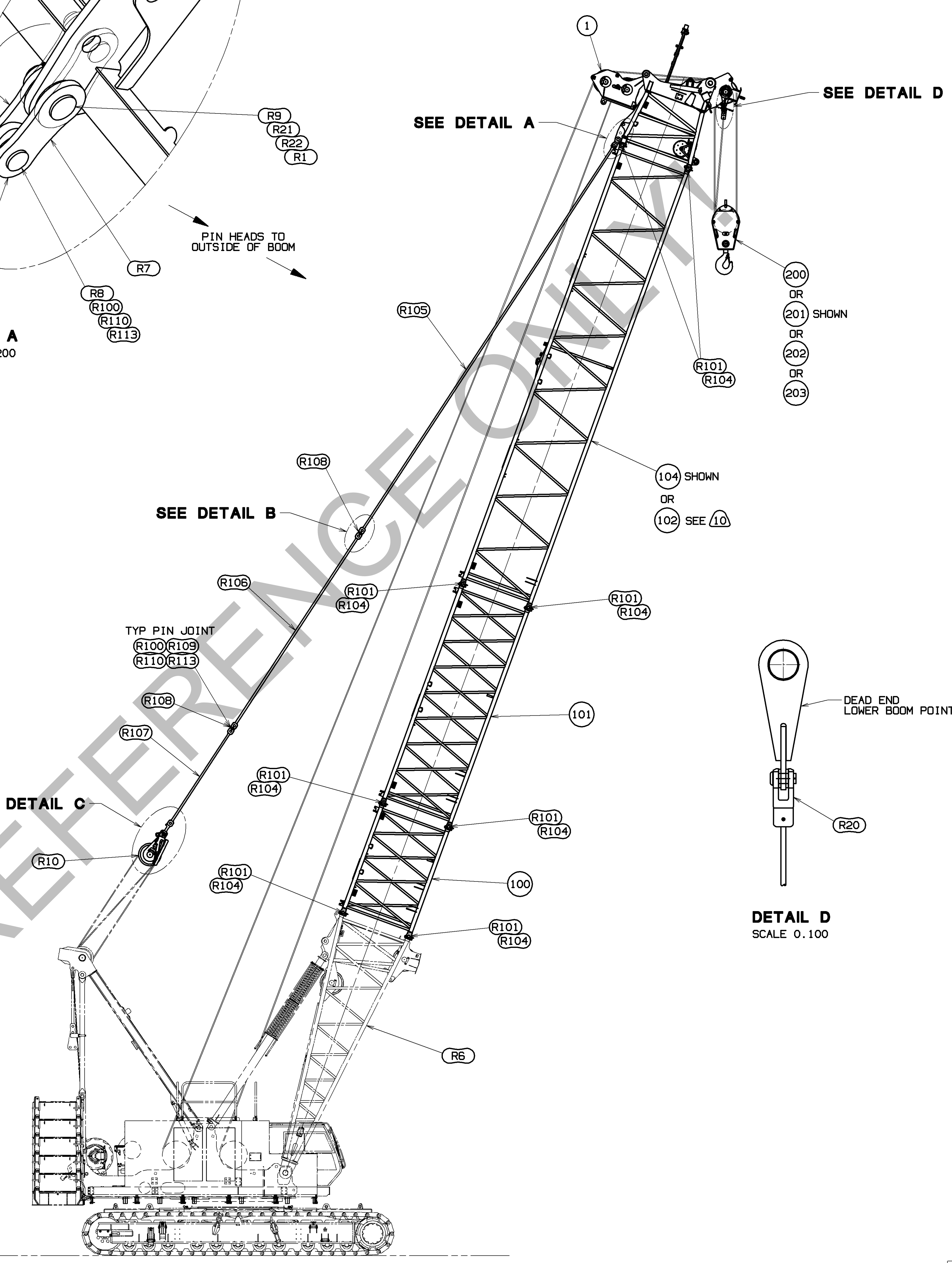
DETAIL B
SCALE 0.350



DETAIL A
SCALE 0.200



DETAIL C
SCALE 0.200



30.0 M (98.4 FT)
#350 BOOM SHOWN

DETAIL D
SCALE 0.100

BILL OF MATERIAL					
NO.	QTY	DESCRIPTION	UNIT	MATERIAL	QTY
BOOM RIGGING B20:350					
1	1	TOP ASSY #350 2.2M CAP		80124037	1
NO. REQ'D FOR THE FOLLOWING ITEMS ARE IN THE BOOM LENGTH TABLE (SHEET 2)					
100	1	INSERT ASSY #350 3M		80117700	2
101	1	INSERT ASSY #350 6M		80117702	3
102	1	INSERT ASSY #350 12M		80117704	4
103					
104	1	INSERT ASSY #350 12M W/LUG		80118954	5
105					
OPTION 1: HOOK BLOCKS					
200	1	BLOCK 135 MTON 5 SHEAVE		80120389	
201	1	BLOCK 85 MTON 3 SHEAVE		80120390	
202	1	BLOCK 30 MTON 1 SHEAVE		80120391	
203	1	OVERHAUL BALL 15 MTON		80120392	
204					
BASIC REFERENCE ITEMS					
R1	10	PIN COTTER 3/16 DIA X 1.50 LG		562085	
R2	2	PIN COTTER 3/8 DIA X 3.00 LG		562150	
R3	2	PIN SAFETY .375x2.25 LG		563871	
R4	2	PIN HAIR COTTER .120 DIA X 2.38 LG		563790	
R5					
R6	1	BUTT ASSY #350 6.8M		80121510	
R7	4	LINK WELD #350		80130186	
R8	2	PIN W/HD 52.15 DIA X 102.25 LG		80130189	
R9	2	PIN W/HD 63.5 DIA X 100.8 LG		80130549	
R10	1	EQUALIZER ASSY		80123530	
R11	4	COLLAR 2.0 OD X .095W (IN)		80124514	
R12	2	PIN W/HD 64.0 DIA X 59.0 LG		80124517	
R13	4	LINK EQUALIZER		80130040	
R14					
R15					
R16	4	PIN 1 HOLE 41.28 OD X 84 LG		80125079	
R17	4	LINK TIE BACK		80125080	
R18	2	PIN 2 HOLE 0.500 DIA X 2.39 LG		140538	
R19					
R20	-	SOCKET BUTTON 22-26MM WIRE ROPE		A11041	11
R21	4	PIN 2 HOLES 12.7 DIA X 93.0 LG		A11799	
R22	4	COLLAR 66mm I.D.		A11800	
R23					
NO. REQ'D FOR THE FOLLOWING REFERENCE ITEMS ARE IN THE BOOM LENGTH TABLE					
R100		PIN COTTER 1/8 DIA X 1.00 LG		562043	
R101		PIN SAFETY .243 OD X 5.00		563640	
R102					
R103					
R104		PIN 2 HOLE 70.0 DIA X 126.0 LG		80118039	
R105		STRAP 12.0M #350		80121465	6
R106		STRAP 6.0M #350		80121466	6
R107		STRAP 3.0M #350		80121467	6
R108		LINK #350		80121469	
R109		PIN W/HD 52.1 DIA X 64.25 LG		80121470	
R110		COLLAR 63.5 DIA X 25.0 LG		80121471	
R111					
R112					
R113		PIN 9.5 DIA X 76.2 LG SST		81037242	
R114					

- 1 TOP 2.2M I.D. TAG #80124038.
- 2 INSERT 3.0M I.D. TAG #80117701.
- 3 INSERT 6.0M I.D. TAG #80117703.
- 4 INSERT 12.0M I.D. TAG #80117705.
- 5 INSERT 12.0M W/BACKSTAY LUG I.D. TAG #80118955.
- 6 ON DRAWING 80121464.
- 7 MAXIMUM NUMBER OF 3 METER INSERTS = 1.
- 8 MAXIMUM NUMBER OF 6 METER INSERTS = 1.
- 9 STARTING WITH BOOM BUTT ASSEMBLY (R6), INSERT ASSEMBLIES MUST BE INSTALLED IN ASCENDING LENGTH.
- 10 THE 12.0M INSERT-ITEM 102 (80117704) CAN BE USED IN PLACE OF THE 12.0M INSERT W/LUGS-ITEM 104 (80118954).
- 11 QUANTITY 1 WHEN STOWS IN PARTS BOX 80124069 AS STANDARD EQUIPPED.
QUANTITY 2 WHEN STOWS IN PARTS BOX 80124069 AS STANDARD EQUIPPED AND OPTION EQUIPPED.
- 12 REMOVE LINKS (80121469), PINS W/HD (80121470), COLLARS (80121471), PINS (81037242) AND COTTERS (562043) FROM STRAPS ON INSERT ATTACHING TO TOP ASSY (ITEM 1).
REPLACE WITH LINKS AND PINS AS PART OF TOP ASSY (ITEM 1).
- 13 MAXIMUM NUMBER OF 12.0M W/BACKSTAY LUG = 1.
THE 12.0M INSERT W/BACKSTAY LUG-ITEM 104 (80118954) CAN BE SUBSTITUTED FOR ANY 12.0M INSERT-ITEM 102 (80117704).

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DECIMAL PLACES	FRACTIONS	ANGLE	ANGLE	ANGLE	ANGLE	ANGLE	ANGLE	ANGLE	ANGLE	ANGLE	ANGLE
(1) PLACE 0.5	1/16	±.12	±.18	±.015	±.015	±.015	±.015	±.015	±.015	±.015	±.015
(2) PLACE 0.00	1/64	±.08	±.12	±.015	±.015	±.015	±.015	±.015	±.015	±.015	±.015
(3) PLACE 0.000	1/1000	±.08	±.12	±.015	±.015	±.015	±.015	±.015	±.015	±.015	±.015

DR: RHY		CHK: DLG		APP: JRR	
MATERIAL		MANUFACTURER		DATE	
80117859		BOOM RIGGING		03-04-21	
B20:350		REV. LIT.		B	

ITEMS REQ'D FOR VARIOUS BOOM LENGTHS - SEE SHEETS 3 & 4 FOR BOOM MAKE-UP

QTY	UNIT	DESCRIPTION	MATERIAL	QTY	UNIT	DESCRIPTION	MATERIAL
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ASSEMBLIES USED ON

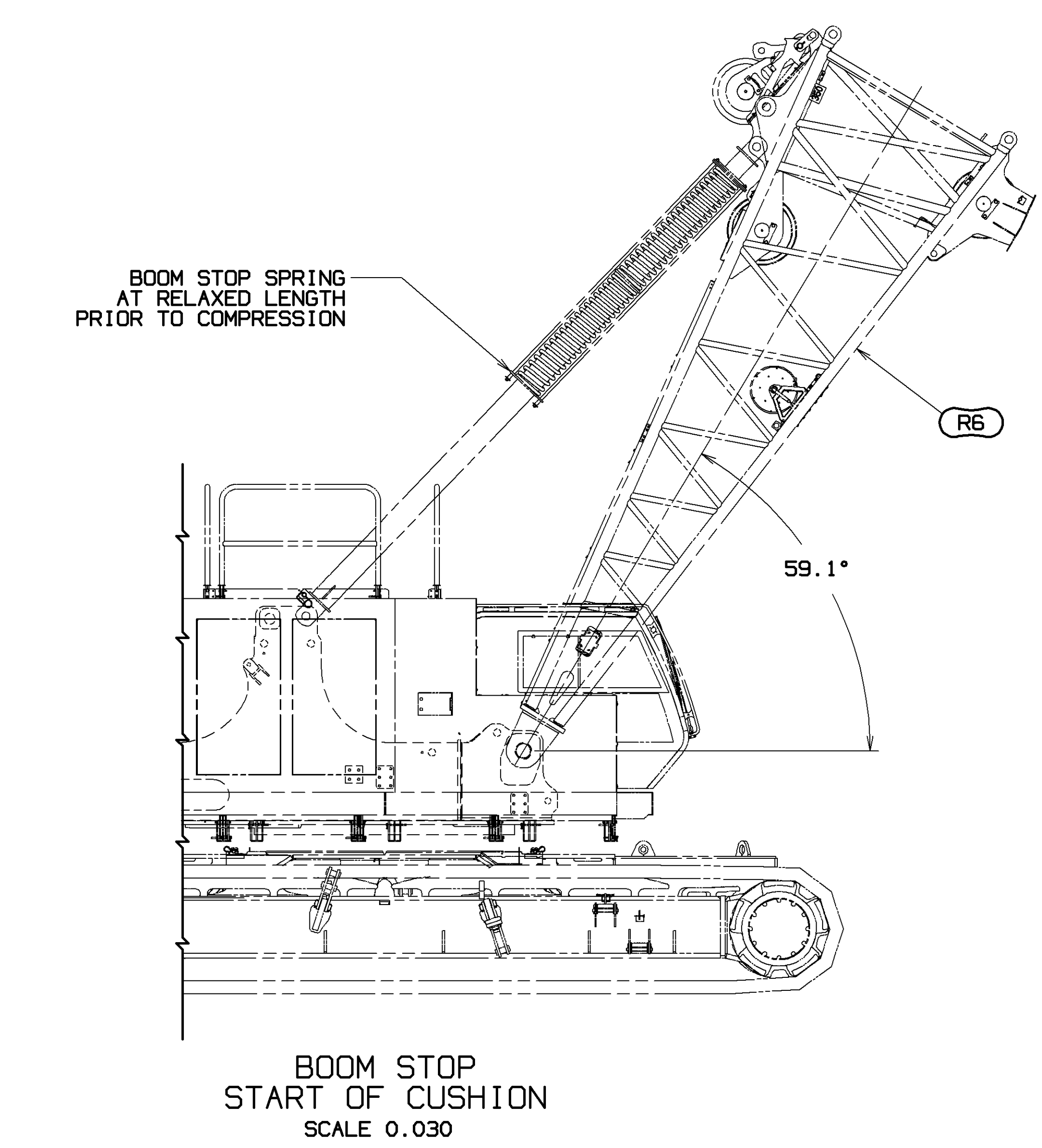
REVISONS

ITEM NO.	DESCRIPTION	QTY	UNIT	DESCRIPTION	MATERIAL
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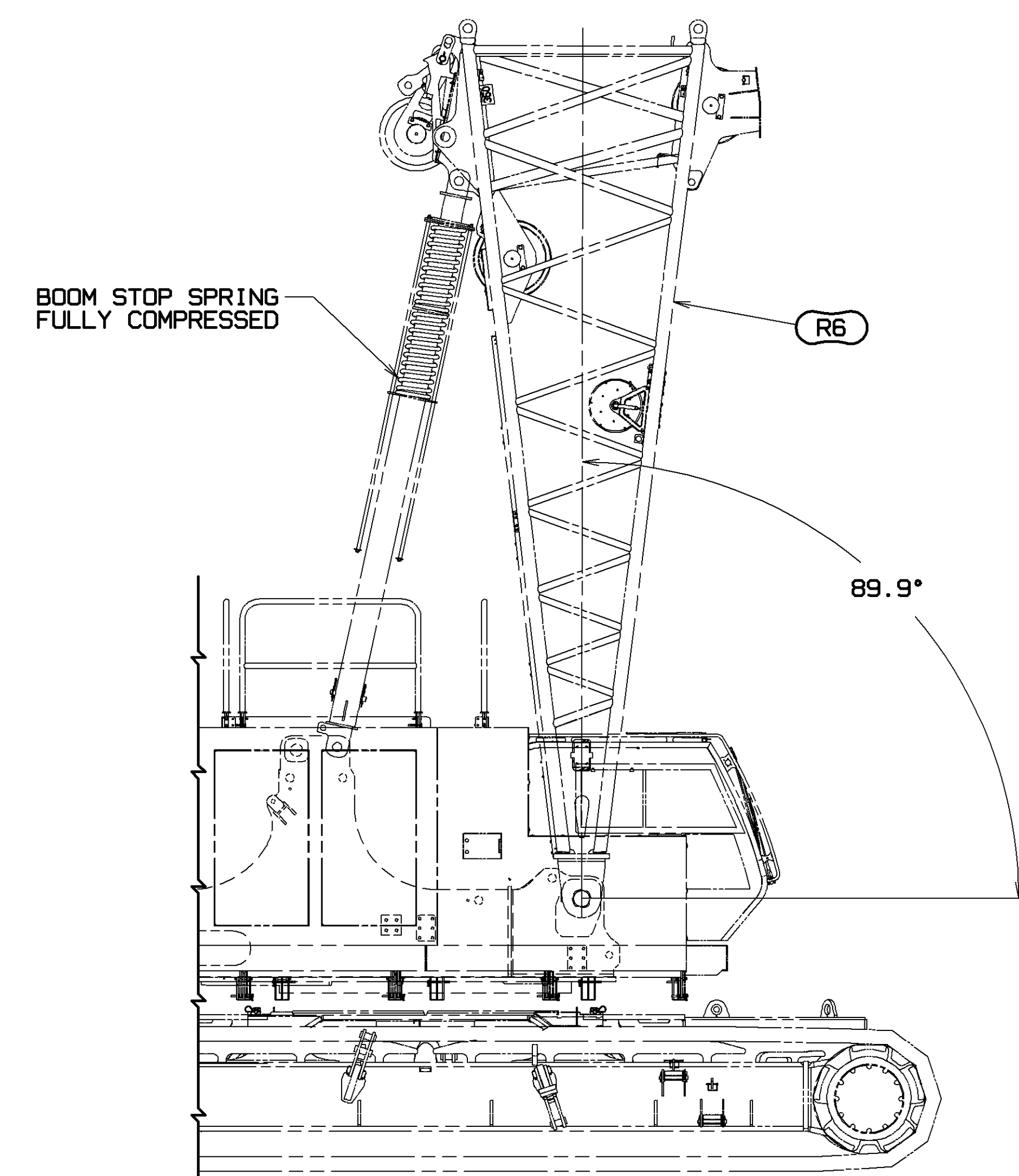
80117859
SHT 2 OF 5

PRIVATE LABELING REQUIREMENT TO CONFORM TO ENGINEERING SPECIFICATION 8629103794 FOR COMPONENTS LISTED IN SECTION 03-036
DATE 03-04-21
REV. LTR. []

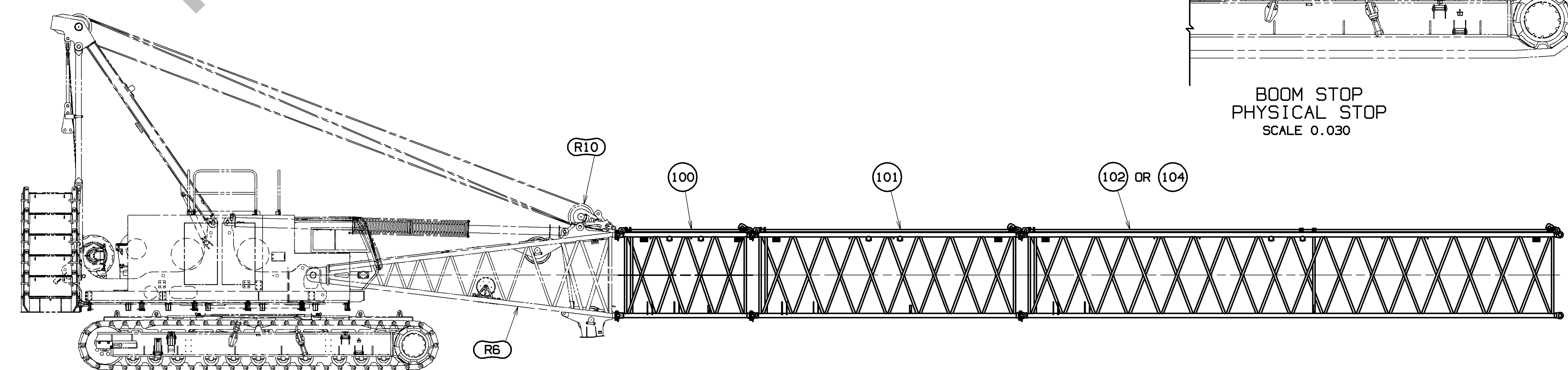
ITEM NO.	#350 INSERTS					CONNECTOR PINS		STRAPS			LINKS	LINK/STRAP CONNECTION			
	100	101	102	102/104 (10)		R101	R104	R107	R106	R105	R108	R100	R109	R110	R113
BOOM LENGTH	INSERT 3M (9.8FT) ASSY	INSERT 6M (19.7FT) ASSY	INSERT 12M (39.4FT) ASSY	INSERT 12M (39.4FT) W/LUG ASSY		SAFETY PIN	PIN TAPERED 2 HOLES	STRAP 3M (9.8FT)	STRAP 6M (19.7FT)	STRAP 12M (39.4FT)	LINK 170mm (6.7in)	COTTER	PIN W/HEAD	COLLAR	PIN CLEVIS
METERS	FEET														
15	49.2	0	1	0	0	16	8	0	2	0	0	4	2	4	4
18	59.1	1	1	0	0	24	12	2	2	0	4	8	6	8	8
21	68.9	0	0	0	1	16	8	0	0	2	0	4	2	4	4
24	78.7	1	0	0	1	24	12	2	0	2	4	8	6	8	8
27	88.6	0	1	0	1	24	12	0	2	2	4	8	6	8	8
30	98.4	1	1	0	1	32	16	2	2	2	8	12	10	12	12
33	108.3	0	0	1	1	24	12	0	0	4	4	8	6	8	8
36	118.1	1	0	1	1	32	16	2	0	4	8	12	10	12	12
39	128.0	0	1	1	1	32	16	0	2	4	8	12	10	12	12
42	137.8	1	1	1	1	40	20	2	2	4	12	16	14	16	16
45	147.6	0	0	2	1	32	16	0	0	6	8	12	10	12	12
48	157.5	1	0	2	1	40	20	2	0	6	12	16	14	16	16
51	167.3	0	1	2	1	40	20	0	2	6	12	16	14	16	16
54	177.2	1	1	2	1	48	24	2	2	6	16	20	18	20	20
57	187.0	0	0	3	1	40	20	0	0	8	12	16	14	16	16
60	196.9	1	0	3	1	48	24	2	0	8	16	20	18	20	20
63	206.7	0	1	3	1	48	24	0	2	8	16	20	18	20	20
66	216.5	1	1	3	1	56	28	2	2	8	20	24	22	24	24



BOOM STOP START OF CUSHION
SCALE 0.030



BOOM STOP PHYSICAL STOP
SCALE 0.030



BOOM HANDLING WITH EQUALIZER PINNED TO BUTT
SCALE 0.020
(SEE STEP 2 AND DETAIL G ON SHEET 5 FOR BUTT TO INSERT ATTACHMENT)

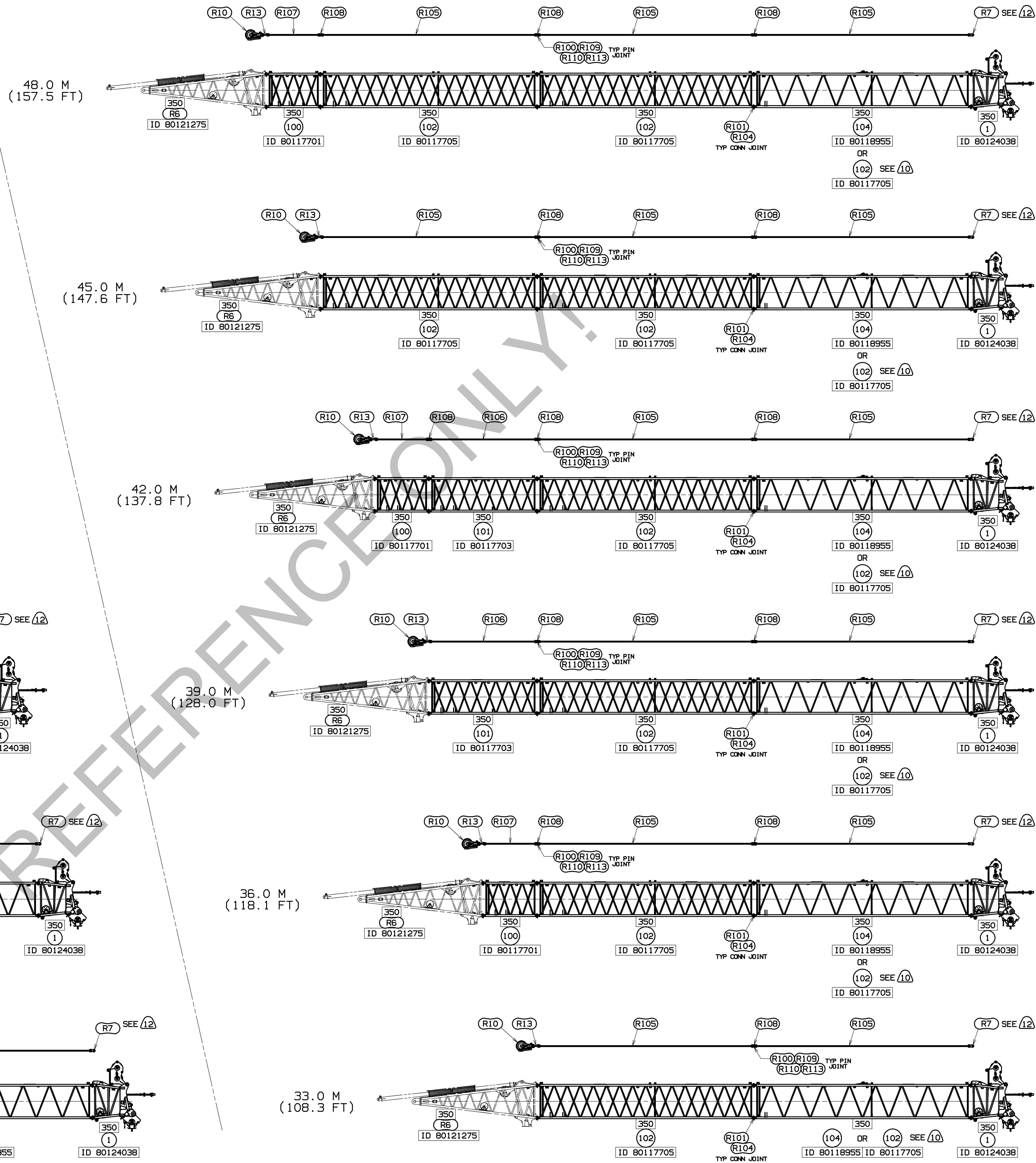
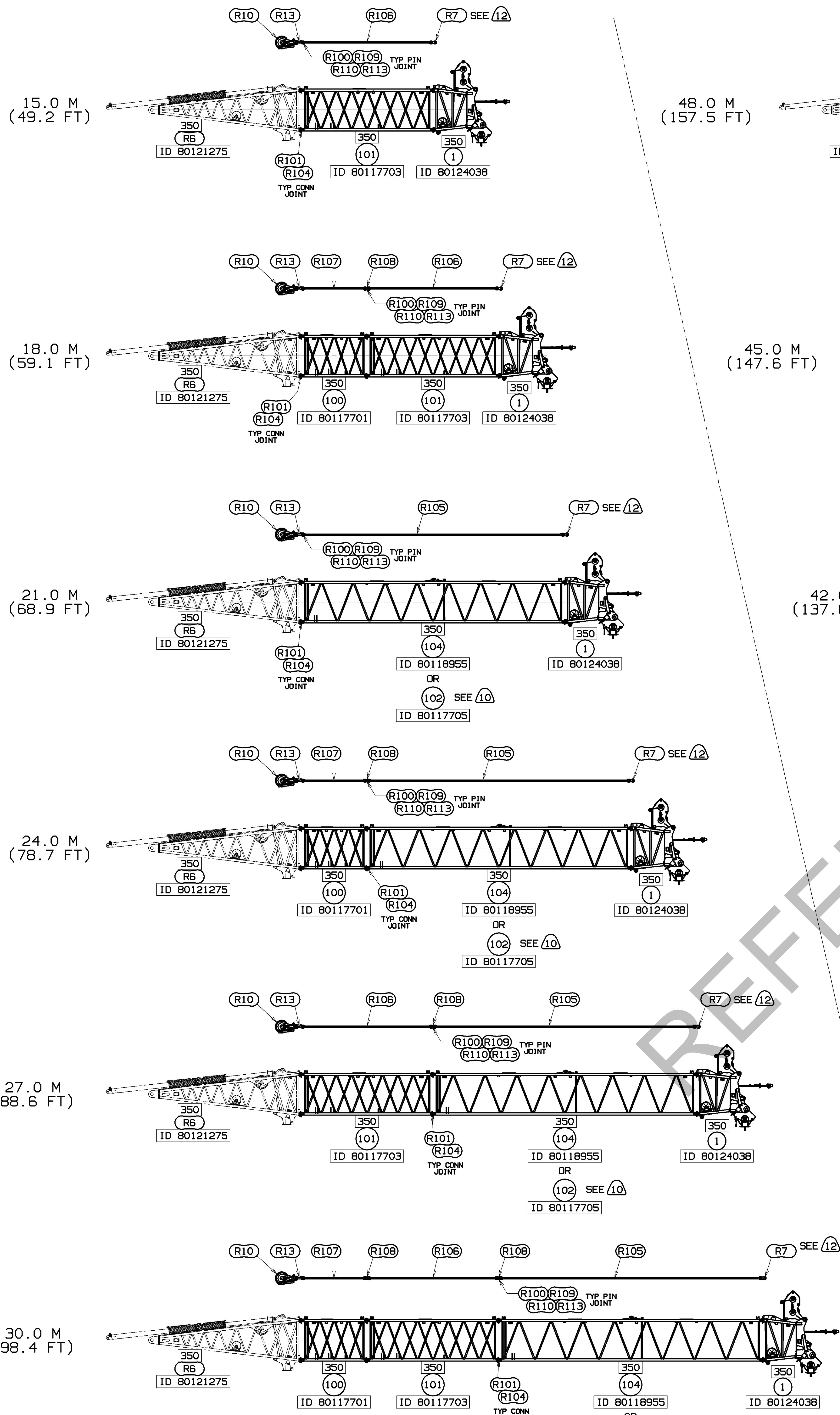
BOOM HANDLING WITH EQUALIZER
WITH EQUALIZER ATTACHED TO BOOM BUTT
MAXIMUM BOOM INSERTS THAT CAN BE CANTILEVERED
BEYOND 6.8M BOOM BUTT IS AS FOLLOWS

LENGTH	3M (9.8FT) INSERT 80117700	6M (19.7FT) INSERT 80117702	12M (39.4FT) INSERT 80117704 OR 80118954
3M (9.8FT)	1	0	0
6M (19.7FT)	0	1	0
9M (29.5FT)	1	1	0
12M (39.4FT)	0	0	1
15M (49.2FT)	1	0	1
18M (59.1FT)	0	1	1
21M (68.9FT)	1	1	1
24M (78.7FT)	0	0	2

DO NOT SCALE THIS DRAWING

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SHT 2 OF 5



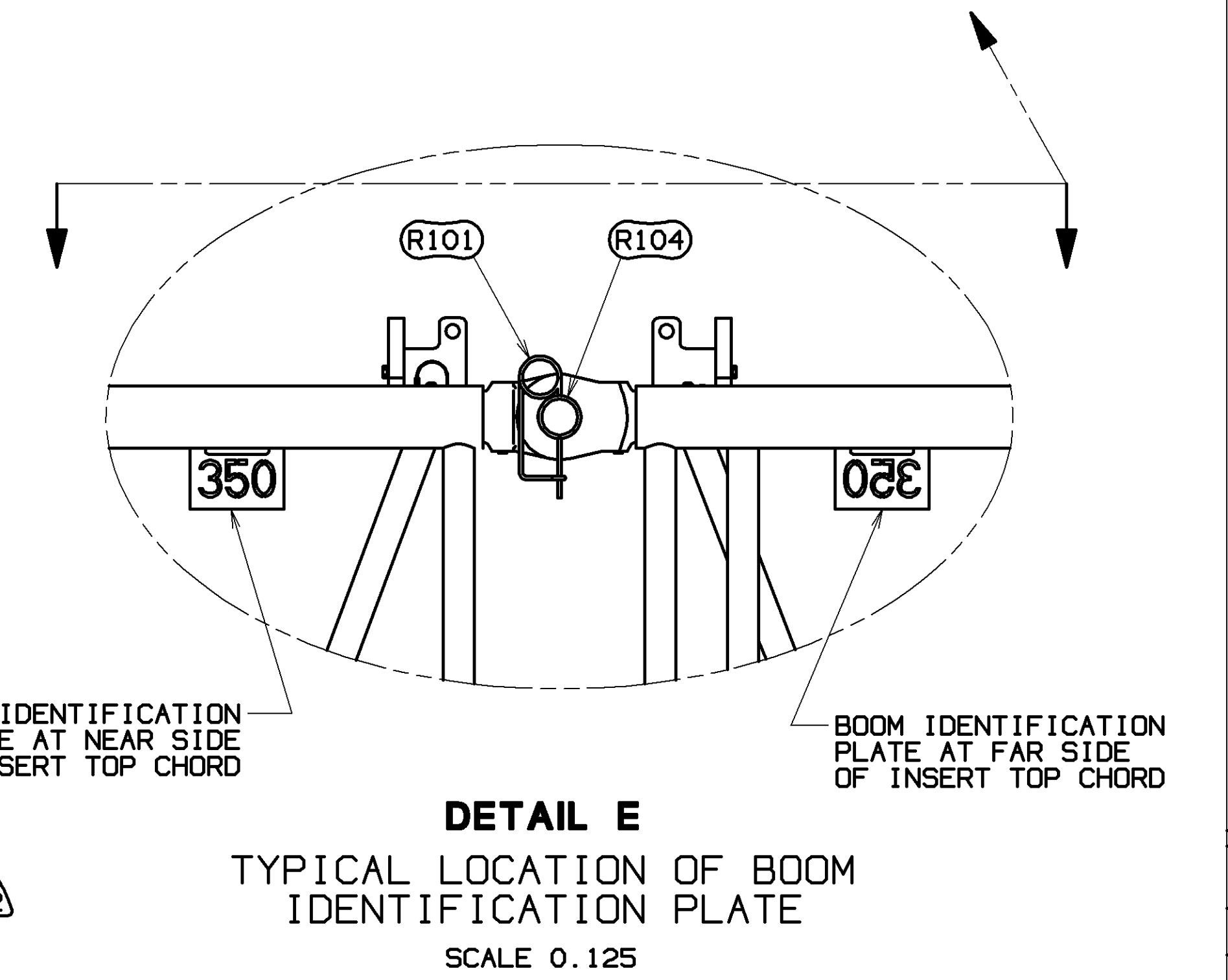
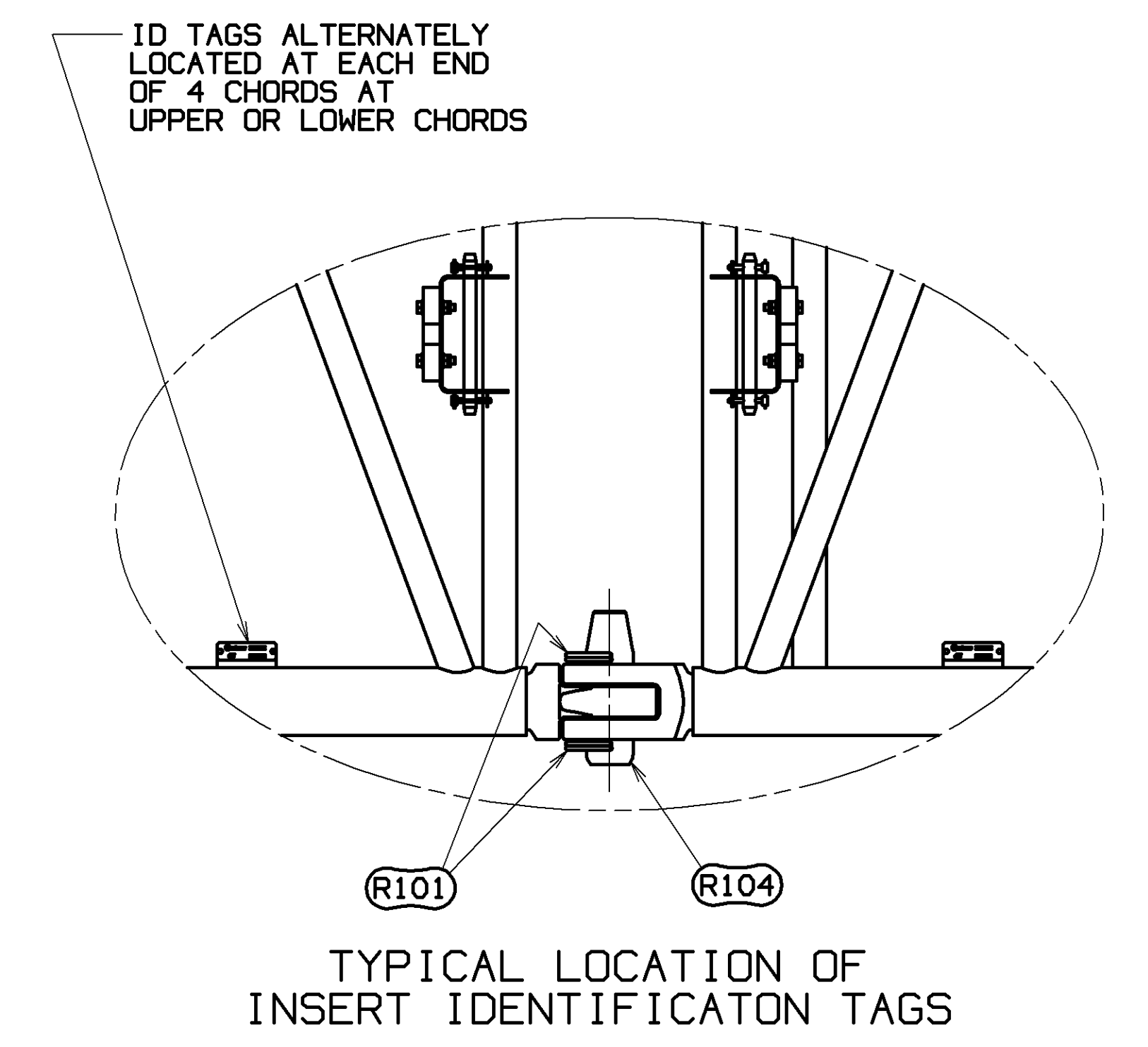
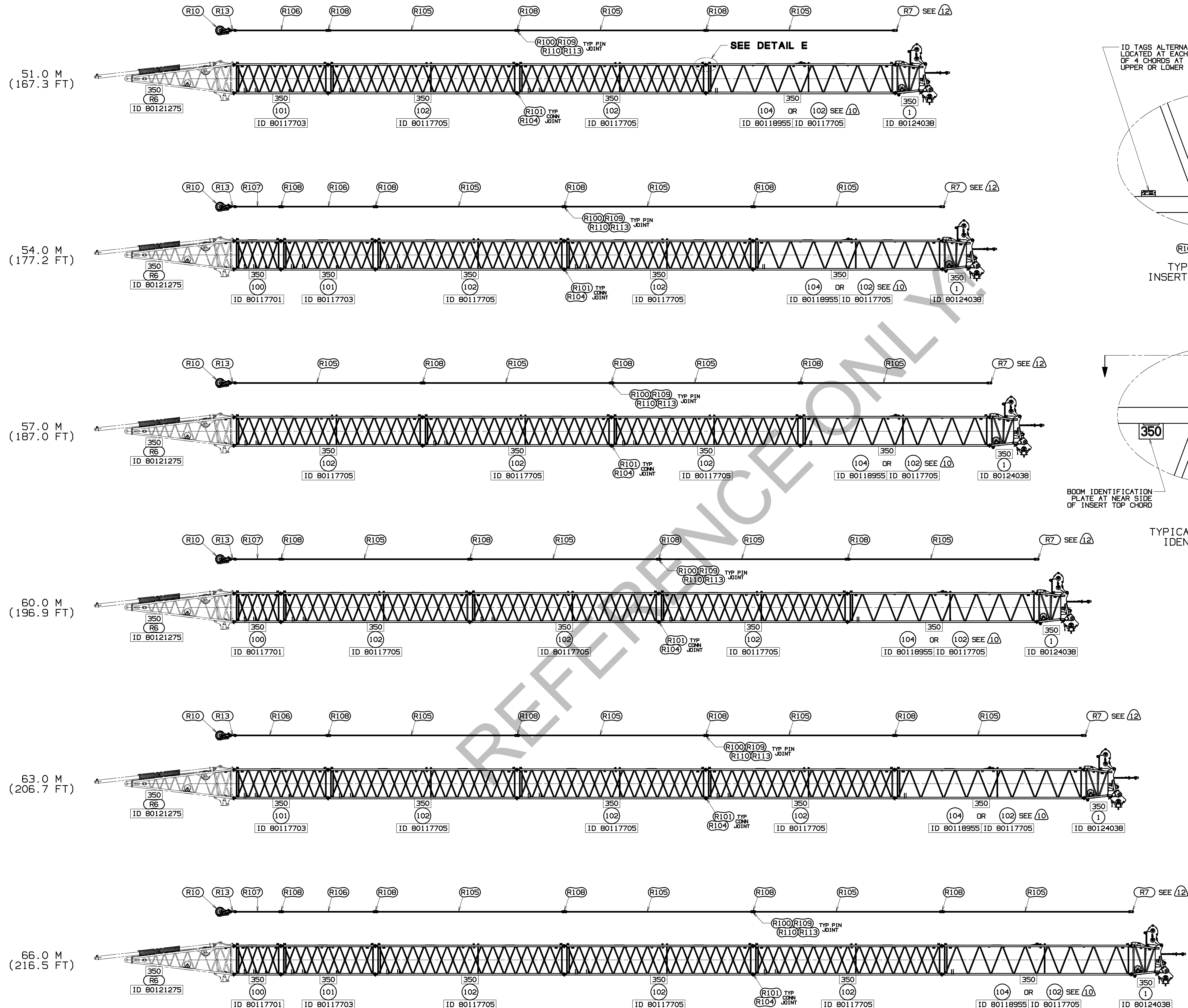
RECOMMENDED BOOM MAKEUP
 FOR TYP PIN JOINT SEE DETAILS A, B, AND C (SEE SHEET 1)
 FOR TYP CONN JOINT SEE DETAIL G (SEE SHEET 5)

DECIMAL PLACES	FABRICATION	MACHINING	WELDING	FINISHING
(1) PLACE 0.5	+0.12	+0.12	+0.12	+0.12
(2) PLACE 0.00	+0.08	+0.12	+0.015	+0.015
(3) PLACE 0.000	+0.008	+0.008	+0.008	+0.008

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DATE	03-04-21
REV. LIT.	B

DR: RHY	MANITOWOC CRANES, INC.	BOOM RIGGING
CK: DLG	Manitowoc, Wisconsin	B20:350
APP: JRR	MODEL: MLC150-1	ID 80117705

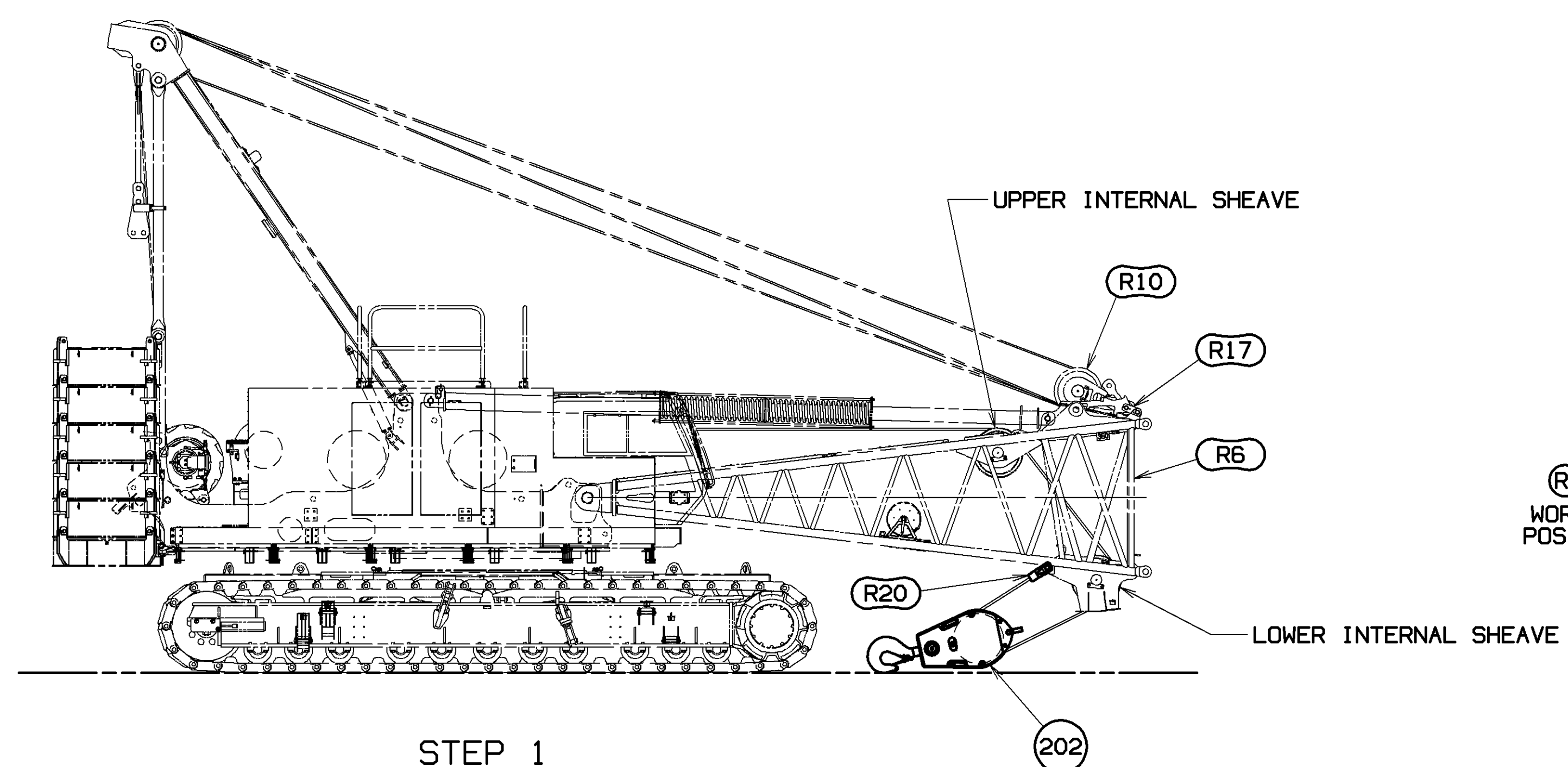


RECOMMENDED BOOM MAKEUP
FOR TYP PIN JOINT SEE DETAILS A, B, AND C (SEE SHEET 1)
FOR TYP CONN JOINT SEE DETAIL G (SEE SHEET 5)

<small>THIS PRINT REMAINS THE PROPERTY OF MANITOWOC CRANES, INC. IF IT IS LOST, SUBJECT TO RETURN UPON DEMAND, AND ON EXPRESS CONDITION THAT IT IS NOT TO BE COPIED OR USED DIRECTLY OR INDIRECTLY IN ANY MANNER UNAUTHORIZED BY OUR INTERESTS.</small>	<small>TOLERANCE UNLESS OTHERWISE SPECIFIED</small>			DATE: 03-04-21 REV. LIT: B
	<small>DECIMAL PLACES</small>	<small>FABRICATION</small>	<small>MACHINING</small>	
	<small>(1) PLACE 0.5</small> <small>(2) PLACE 0.00</small> <small>(3) PLACE 0.000</small>	<small>± 0.12</small> <small>± 0.08</small> <small>± 0.015</small>	<small>± 0.12</small> <small>± 0.015</small> <small>± 0.008</small> <small>± 0.000</small>	

Part No. 0125	Manufacturer Manltowoc Cranes, Inc.	Part Name BOOM RIGGING
Dr. RHY	Location Manitowoc, Wisconsin	Part No. B20:350
Dr. DLG	Model MLC150-1	Part No. 80117859
App. JRR		Part No. 80117859

TO ASSEMBLE BOOM



STEP 1

MACHINE PREP FOR BOOM ASSEMBLY USING BUTT

EQUALIZER (R10) TO BE PINNED TO BOOM BUTT (R6) WITH LINKS (R17). (SEE DETAIL J).

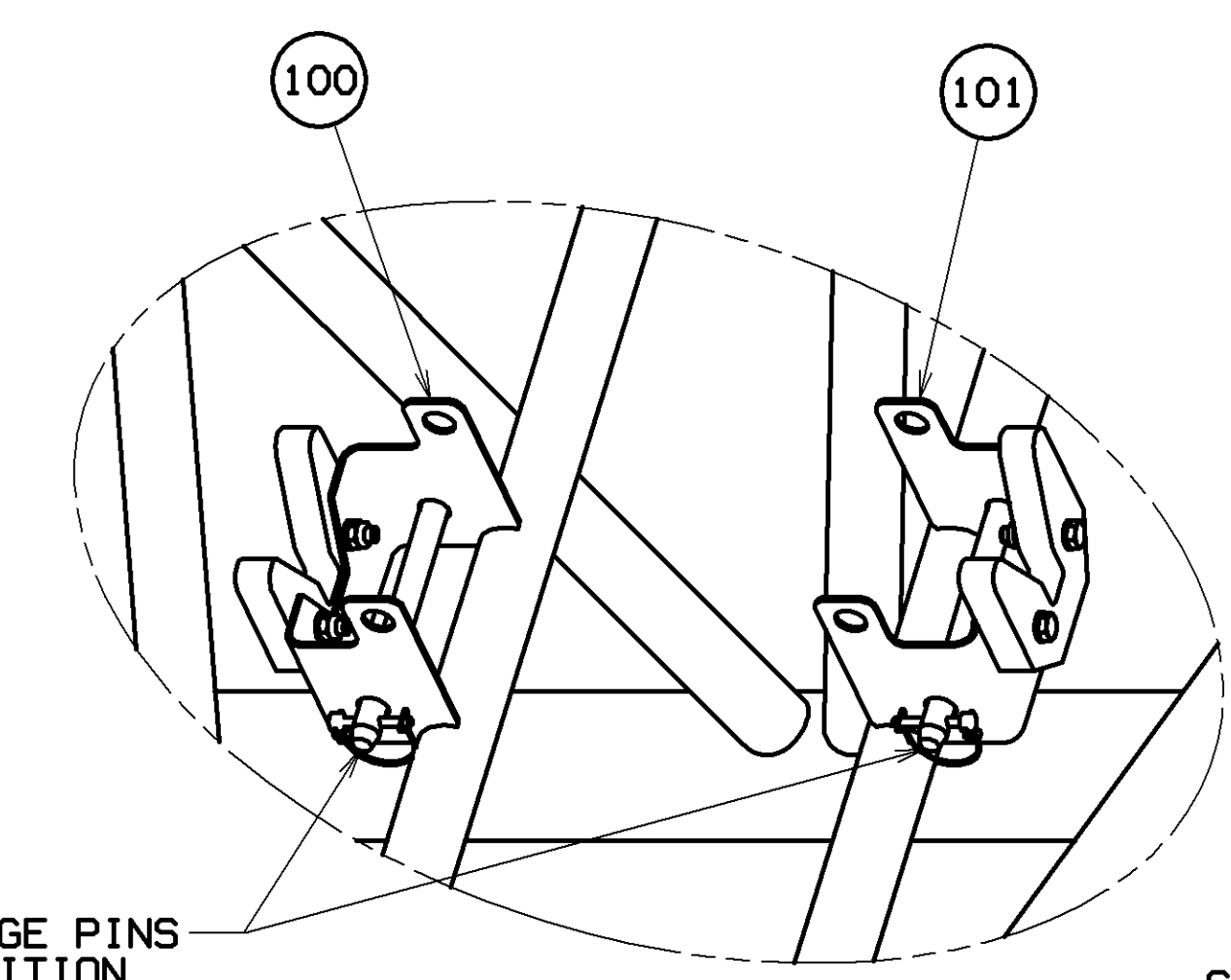
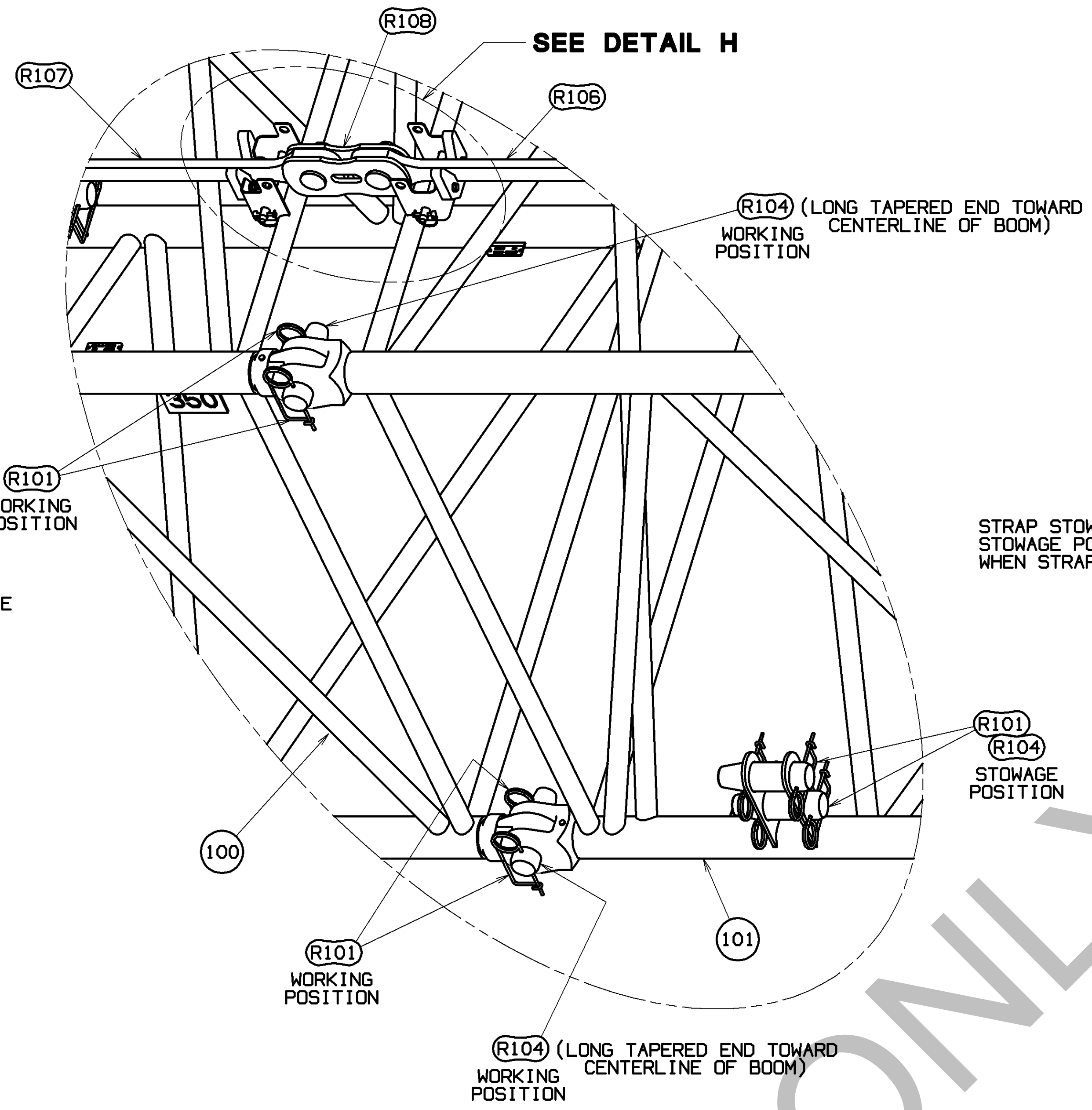
REEVE 2 PARTS LINE FROM FRONT DRUM OVER UPPER AND LOWER INTERNAL BUTT WIRE ROPE SHEAVES AND CONNECT TO BLOCK (ITEM 202) WITH BUTT SOCKET (R20).

ASSEMBLE BOOM COMPLETE, WITHOUT BUTT. DOUBLE TAPERED PIN (R104) AND SAFETY PIN (R101) TO BE INSTALLED AT CONNECTORS. (SEE DETAIL G).

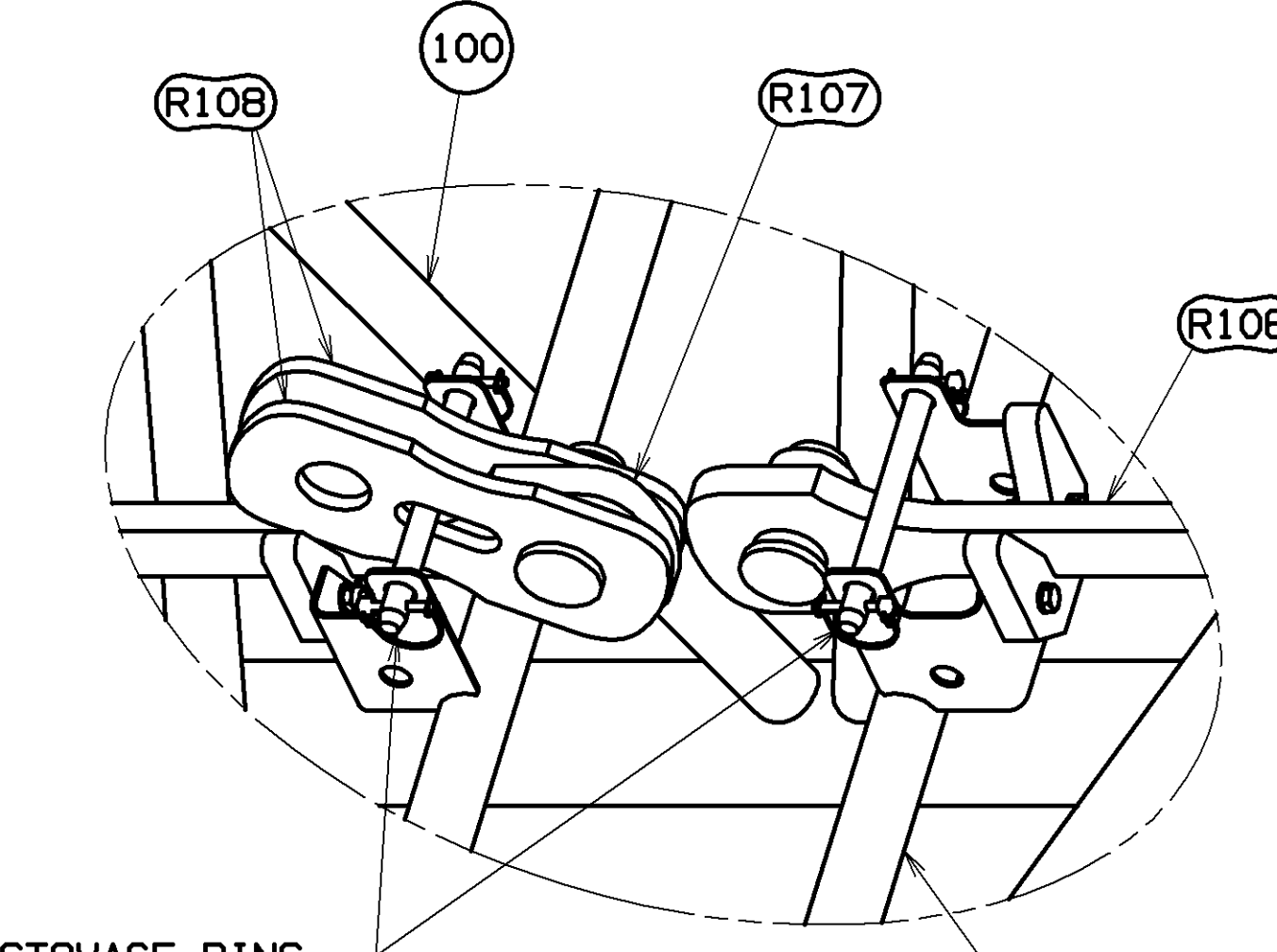
ATTACH TO HANDLING LUG ON WIRE ROPE GUIDE ON TOP ASSY (ITEM 1) AND LIFT TO ROTATE WIRE ROPE GUIDE TO WORKING POSITION. (SEE DETAIL K ON SHEET 5).

ATTACH REAR PINS TO SECURE WIRE ROPE GUIDE TO BOOM TOP/CAP (ITEM 1).

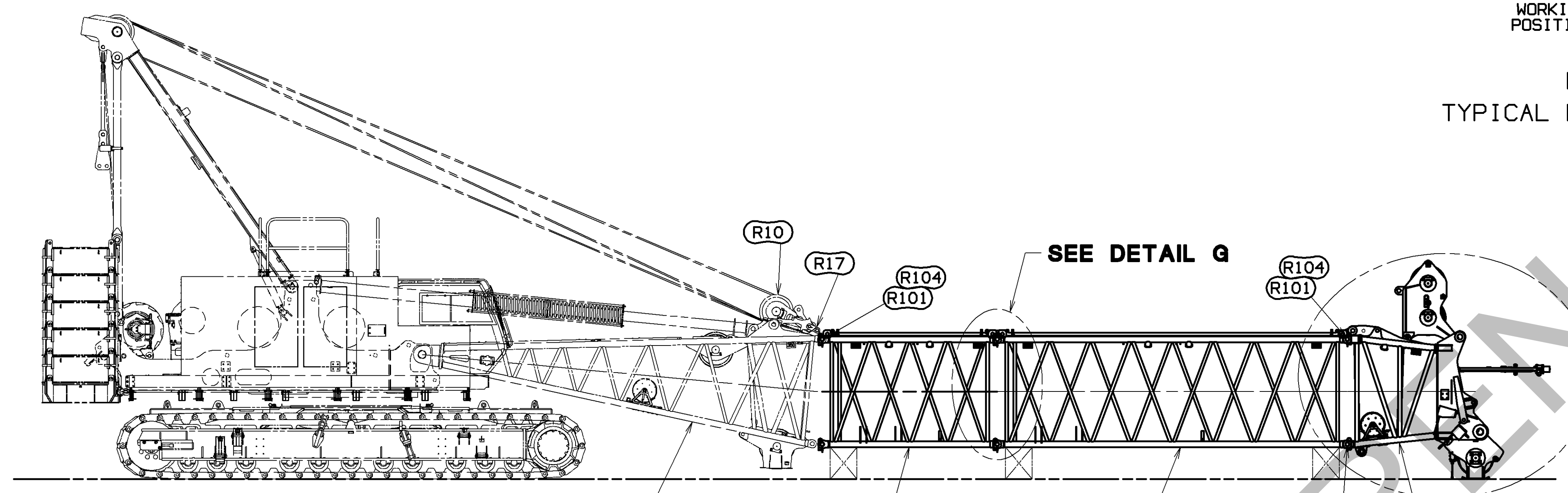
REMOVE BLOCK (ITEM 202) PRIOR TO ASSEMBLY OF BOOM TO BUTT (STEP 2).



DETAIL H
WITHOUT STRAPS/LINKS-PIN/COLLAR/PIN
SCALE 0.200



DETAIL H
WITH STRAPS/LINKS-PIN/COLLAR/PIN
SCALE 0.200

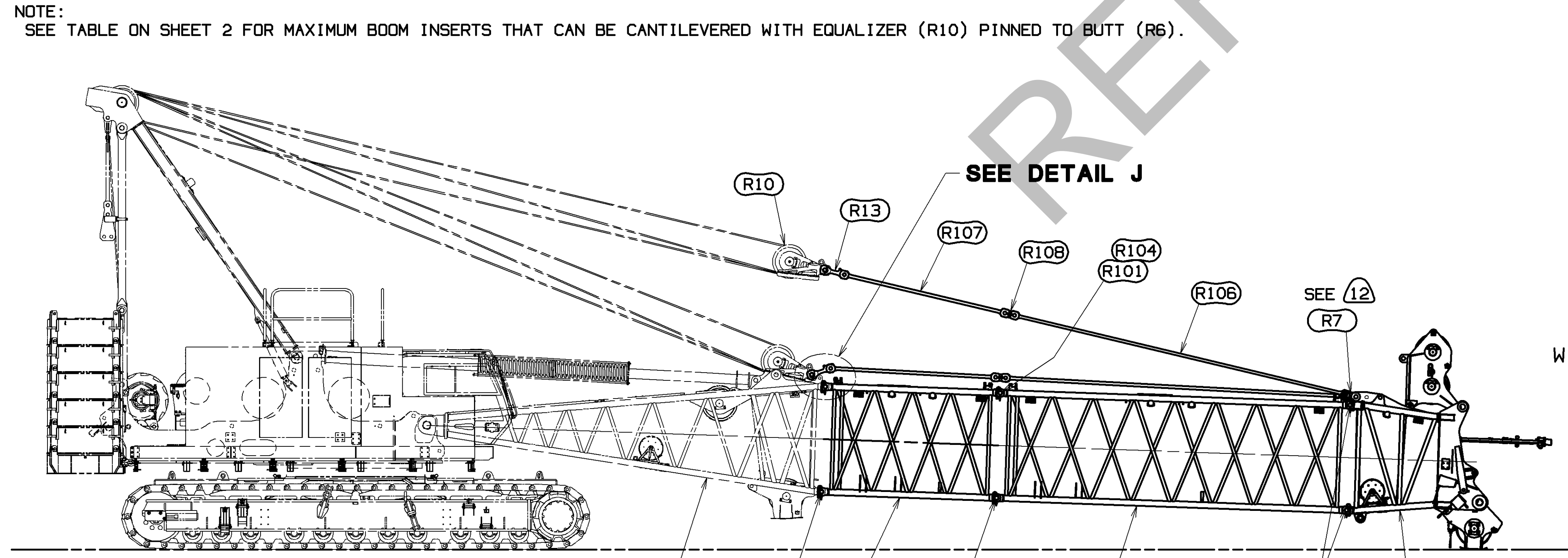


STEP 2
BOOM CLOSING

WITH EQUALIZER (R10) STILL PINNED TO BOOM BUTT (R6) AND THE BOOM INSERTS/TOP ASSEMBLY SUPPORTED ON BLOCKING, POSITION MACHINE TO ALIGN UPPER PIN CONNECTOR ON BOOM BUTT WITH UPPER PIN CONNECTOR PINS ON FIRST BOOM INSERT AND ENGAGE PINS. (SEE DETAIL G)

SLOWLY BOOM UP TO ALIGN LOWER PIN CONNECTOR ON BOOM BUTT WITH LOWER PIN CONNECTOR HOLES IN FIRST BOOM INSERT AND INSERT DOUBLE TAPERED PINS (R104) AND SAFETY PINS (R101). (SEE DETAIL G).

THIS BOOM CLOSING PROCEDURE CAN BE PERFORMED FOR ALL BOOM LENGTHS [15M (49.2FT) - 66M (216.5FT)].



STEP 3
BOOM STRAP ASSEMBLY

ASSEMBLE BOOM STRAPS DESCENDING FROM BOOM TOP (ITEM 1) TO EQUALIZER (R10). (SEE DETAILS A, B, AND C ON SHEET 1). (SEE DELTA 12).

WARNING: CONFIRM THAT STRAP STOWAGE PINS ARE IN STOWED POSITION OR DAMAGE WILL OCCUR WHEN THE BOOM IS RAISED. (SEE DETAIL H ON SHEET 5).

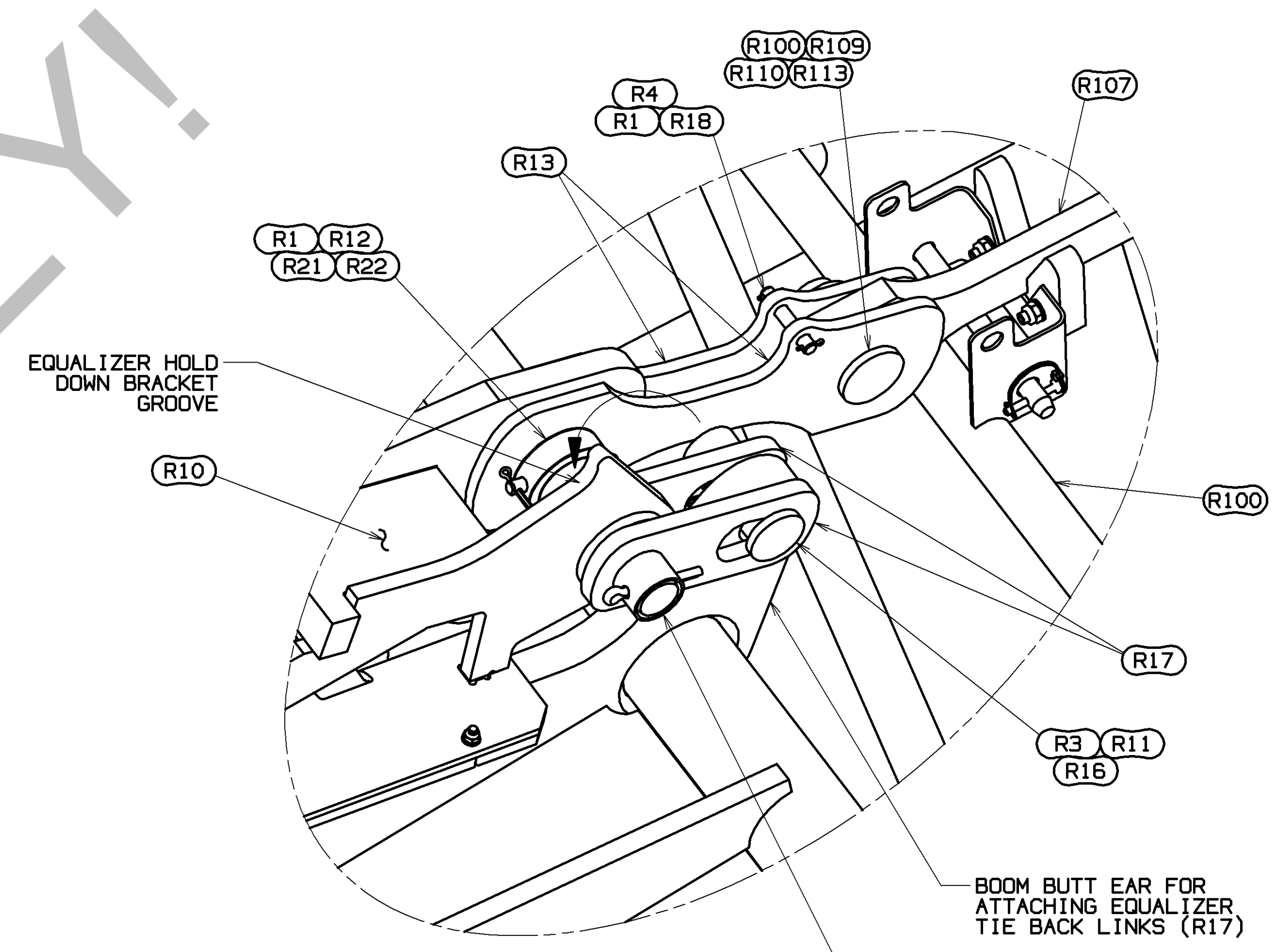
AT EQUALIZER (R10) DETACH AND PIVOT THE (4) EQUALIZER LINKS (R13) PINNED IN STOWAGE LOCATION AROUND EQUALIZER LINK PIN (R12) AND ATTACH EQUALIZER LINKS (R13) TO CORRESPONDING INSERT STRAPS. RETAIN PIN (R18) WITH COTTERS (R1 & R4) WITH EQUALIZER LINKS (R13). (SEE DETAIL C ON SHEET 1 AND DETAIL J ON SHEET 5).

DETACH EQUALIZER (R10) FROM BOOM BUTT (R6) BY REMOVING PIN (R16) WITH COLLAR (R11) AND SAFETY PIN (R3) FROM TIE BACK LINKS (R17). PIVOT TIE BACK LINKS (R17) AROUND UPPER LINK PIN (R16) AND RELOCATE SLOT IN TIE BACK LINKS TO MATCH GROOVE ON EQUALIZER HOLD DOWN BRACKET. (SEE DETAIL J ON SHEET 5).

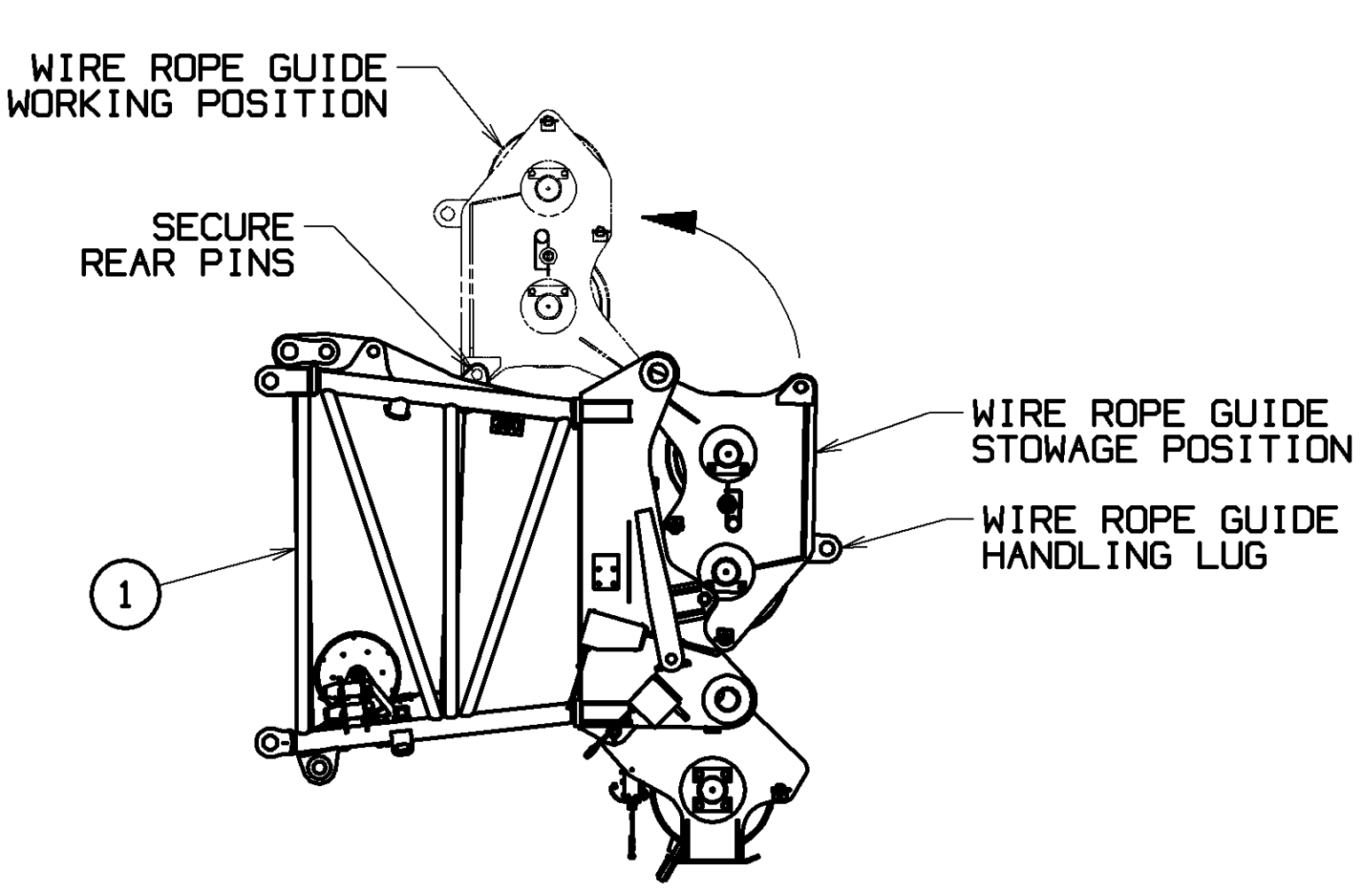
REATTACH PIN (R16), COLLAR (R11) AND SAFETY PIN (R3) INTO SLOTTED TIE BACK LINK HOLE AND EQUALIZER HOLD DOWN BRACKET GROOVE. (SEE DETAIL C ON SHEET 1).

RIG BLOCK (SEE DELTA NOTE 11 ON SHEET 1) AND RAISE BOOM.

DETAIL G
TYPICAL PIN CONNECTORS
SCALE 0.125



DETAIL J
SCALE 0.300



DETAIL K
WIRE ROPE GUIDE STOWED/WORKING POSITIONS
SCALE 0.030

TO DISASSEMBLE BOOM

1. BOOM DOWN AND SUPPORT BOOM ON BLOCKING. UNREEVE BLOCK.
 2. ATTACH EQUALIZER (R10) TO BOOM BUTT (R6). UNPIN TIE BACK LINKS (R17) FROM STOWAGE LOCATION ON EQUALIZER HOLD DOWN BRACKET (SEE DETAIL C ON SHEET 1) AND ROTATE TO REATTACH TIE BACK LINKS TO EAR ON BOOM BUTT. (SEE DETAIL J ON SHEET 5).
 3. WITH BOOM STRAPS POSITIONED IN BRACKETS ON INSERTS UNPIN LINKS (R108) AND ROTATE THEM INTO SHIPPING POSITION AND RETAIN THEM TO STRAPS WITH STOWAGE PIN. (SEE DETAIL H ON SHEET 5). DETACH BOOM TOP LINKS (R7) FROM BOOM STRAP AND ROTATE LINKS INTO SHIPPING POSITION AND RETAIN THEM TO BOOM TOP REUSING PIN/COLLAR/PIN (R8, R100, R110, AND R113). (SEE DETAIL A ON SHEET 1).
 4. AT EQUALIZER/INSERT JOINT DETACH THE (4) EQUALIZER LINKS (R13) FROM THE INSERT STRAP. PIVOT THE (4) EQUALIZER LINKS (R13) AROUND EQUALIZER LINK PIN (R12) AND USE PIN (R4) FROM BETWEEN LINKS (R13) TO ATTACH TO LUGS ON EQUALIZER FRAME.
 5. SLOWLY BOOM UP TO CREATE ENOUGH TENSION TO SUPPORT BOOM BUTT (R6) WHEN LOWER CONNECTOR PINS (R104) ARE REMOVED.
 6. REMOVE PINS (R104) FROM LOWER PIN CONNECTORS AT BUTT JOINT AND BOOM DOWN TO BLOCKING. (SEE VIEW 'STEP 2 BOOM CLOSING')
 7. REMOVE PINS (R104) FROM UPPER PIN CONNECTORS AT BUTT JOINT.
- WARNING:
BOOM MUST BE PROPERLY BLOCKED TO PREVENT SHIFTING DURING PIN REMOVAL.
8. SLOWLY BACK AWAY FROM BOOM.
 9. REPEAT ASSEMBLY STEP 1 TO PREP MACHINE WITH BLOCK (ITEM 200, 201, OR 202) FOR DISASSEMBLY OF BOOM.
 10. DISASSEMBLE BOOM.
 11. UNPIN REAR PINS OF WIRE ROPE GUIDE ON TOP ASSY (ITEM 1) AND PIVOT WIRE ROPE GUIDE TO SHIPPING POSITION. (SEE DETAIL K ON SHEET 5).

DECIMAL PLACES	FRACTIONS	ANGLE	WELDING	DR. RHY	DATE	BY
(1) PLACE 0.5	1/2	15, 30, 45, 60, 75, 90	WELDING	DR. DLG	03-04-21	B
(2) PLACE 0.00	1/16, 1/8, 3/16, 1/4, 3/8, 1/2, 5/8, 3/4	15, 30, 45, 60, 75, 90	WELDING	DR. DLG		
(3) PLACE 0.000	1/64, 1/32, 3/64, 1/16, 1/8, 3/16, 1/4, 3/8, 1/2, 5/8, 3/4	15, 30, 45, 60, 75, 90	WELDING	APP. JRR		

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TOLERANCE UNLESS OTHERWISE SPECIFIED

MANITOWOC CRANES, INC.
Manitowoc, Wisconsin
MODEL MLC150-1
BOOM RIGGING
B20:350

DATE: 03-04-21
REV. LNK: B

80117859
SHT 5 OF 5