Manitowoc Cranes, Inc.
Manitowoc, Wisconsin 54220 U.S.A.

Luffing Jib Raising Procedure 999 SERIES 2, 3

Fixed Jib No. 134 On Luffing Jib No. 149 On Boom No. 82

Recommended boom, luffing jib and fixed jib raising and lowering procedure

999 SERIES 2 equipped with 184,600 Lb. (83 730 kg) crane counterweight and 44,000 Lb. (19 960 kg) carbody counterweight and 999 SERIES 3 equipped with 219,600 Lb. (99 610 kg) crane counterweight and 80,000 Lb. (36 290 kg) carbody counterweight for raising and lowering boom and luffing jib combinations. Refer to fixed jib assembly **No. 196404** and luffing jib rigging assembly **No. A01031** for proper make-up of inserts, straps, pendants and miscellaneous parts, etc.

Two methods may be used to raise and lower boom and luffing jib combinations.

A. Layout Jack-Knife Method With Fixed Jib Attached

Raising:

Boom, luffing jib and fixed jib are assembled in layout, end to end, position. Raise fixed jib strut and attach pendants and backstays. Attach fixed jib stop to luffing jib top in fold back position (raising). Boom, luffing jib and fixed jib must be inline over front of blocked crawlers prior to raising boom and luffing jib. Luff up jib strut until straps on insert next to butt are clear of strap brackets (jib strut at approximately 60 degrees). Slowly raise boom until luffing jib stop strut is just clear of ground. Attach luffing jib stop pendants and unpin luffing jib stop inner strut from retracted position. Slowly raise boom until luffing jib stop strut is fully extended and pins engaged (approximately 168 degree boom to luffing jib angle). Boom is then raised while luffing jib and fixed jib point rollers roll on ground. Tension should be applied to luffing jib hoist to keep luffing jib strut off luffing jib during boom raising. Boom up until boom to luffing jib angle reaches value specified in tables. Tighten luffing jib suspension with luffing jib hoist. ***Caution***: Do not under any condition allow fixed jib butt to luffing jib top angle become less than 95 degrees. Boom and luffing jib are then raised together using boom hoist while fixed jib point roller rolls on ground. Continue raising until fixed jib suspension tightens. Insert pin through jib stop link and luffing jib top. Boom, luffing jib and fixed jib are then raised together using boom hoist until boom reaches 85 degrees. Fixed jib radius must be within capacity chart before swinging over side of machine. Boom may then be adjusted to desired operating angle.

Lowering:

Position boom at 88 degrees with boom, luffing jib and fixed jib inline over front of blocked crawlers prior to lowering luffing jib. Set load blocks, hook and weight ball on ground before lowering boom, luffing jib and fixed jib to ground. Lower luffing jib until boom to luffing jib angle reaches value specified in tables. Lower boom until fixed jib point roller is just above ground. Remove fixed jib stop pin from luffing jib top. Lower boom as fixed jib point roller rolls on ground until luffing jib point rollers contact ground. ***Caution***: Do not under any condition allow fixed jib butt to luffing jib top angle become less than 95 degrees. If luffing jib is hanging at or near vertical, raise luffing jib a few degrees forward of vertical to allow luffing jib to roll out. ***Caution:*** Be careful not to damage upper jib point after contacting ground by booming down and rollers not wanting to roll out. Continue to lower boom while luffing jib and fixed jib point rollers roll on ground. Keep enough tension on luffing jib hoist to keep luffing jib strut off luffing jib. Stop lowering boom when luffing jib stop pendants start to go into tension (approximately 168 degree boom to luffing jib angle). Disengage luffing jib stop strut pins and lower boom to retract luffing jib stop inner strut. Pin strut in retracted position and unpin luffing jib stop pendants. Rotate luffing jib stop struts to rear and lower boom onto blocking.

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B. Layout Jack-Knife Method With Fixed Jib Attached Before Luffing Jib Lift-Off

Raising:

Boom and luffing jib are assembled in layout, end to end, position. Boom and luffing jib must be inline over front of blocked crawlers prior to raising boom and luffing jib. Attach fixed jib backstay pendants to luffing jib insert and place on top of jib top. Luff up jib strut until straps on insert next to butt are clear of strap brackets (jib strut at approximately 60 degrees). Slowly raise boom until luffing jib stop strut is just clear of ground. Attach luffing jib stop pendants and unpin luffing jib stop inner strut from retracted position. Slowly raise boom until luffing jib stop strut is fully extended and pins engaged (approximately 168 degree boom to luffing jib angle). Boom is then raised while luffing jib point rollers roll on ground. Tension should be applied to luffing jib hoist to keep luffing jib strut off luffing jib during boom raising. Boom up until boom to luffing jib angle reaches value specified in tables. Tighten luffing jib suspension with luffing jib hoist. Attach fully assembled fixed jib to luffing jib. ***Caution***: Do not under any condition allow fixed jib butt to luffing jib top angle become less than 95 degrees. Attach fixed jib stop to luffing jib top in fold back position (raising). Attach fixed jib backstays to fixed jib strut. Boom and luffing jib are raised together using boom hoist while fixed jib point roller rolls on ground. Continue raising until fixed jib suspension tightens. Insert pin through jib stop link and luffing jib top. Boom, luffing jib and fixed jib are then raised together using boom hoist until boom reaches 85 degrees. Fixed jib radius must be within capacity chart before swinging over side of machine. Boom may then be adjusted to desired operating angle.

Lowering:

Position boom at 88 degrees with boom, luffing jib and fixed jib inline over front of blocked crawlers prior to lowering luffing jib. Set load blocks, hook and weight ball on ground before lowering boom, luffing jib and fixed jib to ground. Lower luffing jib until boom to luffing jib angle reaches value specified in tables. Lower boom until fixed jib point roller is just above ground. Remove fixed jib stop pin from luffing jib top. Lower boom as fixed jib point roller rolls on ground until luffing jib point rollers contact ground. ***Caution***: Do not under any condition allow fixed jib butt to luffing jib top angle become less than 95 degrees. Remove fixed jib from luffing jib. If luffing jib is hanging at or near vertical, raise luffing jib a few degrees forward of vertical to allow luffing jib to roll out. ***Caution:*** Be careful not to damage upper jib point after contacting ground by booming down and rollers not wanting to roll out. Continue to lower boom while luffing jib rollers roll on ground. Keep enough tension on luffing jib hoist to keep luffing jib strut off luffing jib. Stop lowering boom when luffing jib stop pendants start to go into tension (approximately 168 degree boom to luffing jib angle). Disengage luffing jib stop strut pins and lower boom to retract luffing jib stop inner strut. Pin strut in retracted position and unpin luffing jib stop pendants. Rotate luffing jib stop struts to rear and lower boom onto blocking.

Boom and luffing jib combinations in following tables require layout jack knifing to a specified boom to luffing jib angle for raising and lowering.

Refer to column A for Maximum Number of Lower Boom Point Sheaves allowed. Boom length shown with (a) requires only the middle two sheaves in lower boom point. All other sheaves must be removed from lower boom point. Boom lengths shown with (b) require lower boom point to be removed.

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WITH OR WITHOUT BOOM CATWALKS							
LAYOUT JACK-KNIFE METHOD - 999 SERIES 2							
Maximum Boom, Luffing Jib and Fixed Jib Lengths Lifted Unassisted Over End Of Blocked Crawlers							
Boom Length		Luffing Jib No. 149		Fixed Jib No. 134		Boom To Luffing Jib Angle	**A** Maximum Number of Lower Boom Point Sheaves
Feet	Meters	Feet	Meters	Feet	Meters	Degrees	
Without Intermediate Fall							
80	24.4	170 - 210	51.8 - 64.0	30 - 80	9.1 - 24.4	90	8
120	36.6	170 - 210	51.8 - 64.0	30 - 80	9.1 - 24.4	90	8
160	48.8	170 - 210	51.8 - 64.0	30 - 80	9.1 - 24.4	60	8
(a) 180	54.9	170	51.8	30 - 80	9.1 - 24.4	60	2
With Intermediate Fall							
80	24.4	170 - 210	51.8 - 64.0	30 - 80	9.1 - 24.4	90	8
120	36.6	170 - 210	51.8 - 64.0	30 - 80	9.1 - 24.4	90	8
160	48.8	170 - 210	51.8 - 64.0	30 - 70	9.1 - 21.3	60	8
160	48.8	170 - 200	51.8 - 61.0	80	24.4	60	8
Load blocks, hook and weight ball on ground until boom and luffing jib are erected.							

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WITH OR WITHOUT BOOM CATWALKS

LAYOUT JACK-KNIFE METHOD - 999 SERIES 3

Maximum Boom, Luffing Jib and Fixed Jib Lengths Lifted Unassisted Over End Of Blocked Crawlers

Boom Length		Luffing Jib No. 149		Fixed Jib No. 134		Boom To Luffing Jib Angle	**A** Maximum Number of Lower Boom Point Sheaves
Feet	Meters	Feet	Meters	Feet	Meters	Degrees	
Without Intermediate Fall							
80	24.4	170 - 210	51.8 - 64.0	30 - 80	9.1 - 24.4	90	8
110	33.5	190	57.9	60	18.3	90	8
120	36.6	170 - 210	51.8 - 64.0	30 - 80	9.1 - 24.4	90	8
160	48.8	170 - 210	51.8 - 64.0	30 - 80	9.1 - 24.4	90	8
180	54.9	170 - 210	51.8 - 64.0	30 - 80	9.1 - 24.4	60	8
(a) 190	57.9	170 - 190	51.8 - 57.9	30 - 80	9.1 - 24.4	60	2
(b) 190	57.9	200 - 210	61.0 - 64.0	30 - 80	9.1 - 24.4	60	0
(b) 200	61.0	170	51.8	30 - 80	9.1 - 24.4	60	0
With Intermediate Fall							
80	24.4	170 - 210	51.8 - 64.0	30 - 80	9.1 - 24.4	90	8
120	36.6	170 - 210	51.8 - 64.0	30 - 80	9.1 - 24.4	90	8
160	48.8	170 - 210	51.8 - 64.0	30 - 70	9.1 - 21.3	60	8
160	48.8	170 - 200	51.8 - 61.0	80	24.4	60	8
180	54.9	170 - 210	51.8 - 64.0	30 - 70	9.1 - 21.3	60	8
180	54.9	170 - 200	51.8 - 61.0	80	24.4	60	8
(a) 190	57.9	170 - 180	51.8 - 54.9	30 - 80	9.1 - 24.4	60	2
(b) 190	57.9	190	57.9	30 - 80	9.1 - 24.4	60	0

Load blocks, hook and weight ball on ground until boom and luffing jib are erected.

200 Ft. (61.0m) boom length without boom catwalks with 170 Ft. (51.8m) luffing jib with intermediate fall, requires luffing jib Assemble-In-Air raising procedure **No. 8411-A** and luffing jib rigging assembly **No. A01426**.