
WIND CONDITIONS

MODEL M-250, 2250, AND MAX-ER™ 225 OR 400

Table of Contents

General.....	1
Manitowoc Recommendations	3
Operation Permitted.....	3
Crane.....	3
Max-Er Attachment.....	5
Operation Not Permitted	7
Boom, Boom with Fixed Jib, or Boom with Luffing Jib	7
Boom with Luffing Jib and Fixed Jib.....	7

General

Wind adversely affects lifting capacity and stability as shown in Figure 1. The result could be loss of control over the load and crane, even if the load is within the crane's capacity.

WARNING



TIPPING CRANE HAZARD! Judgment and experience of qualified operators, job planners, and supervisors must be used to compensate for affect of wind on lifted load and boom by reducing ratings, reducing operating speeds, or a combination of both.

Failing to observe this precaution can cause crane to tip or boom and/or jib to collapse. Death or serious injury to personnel can result.

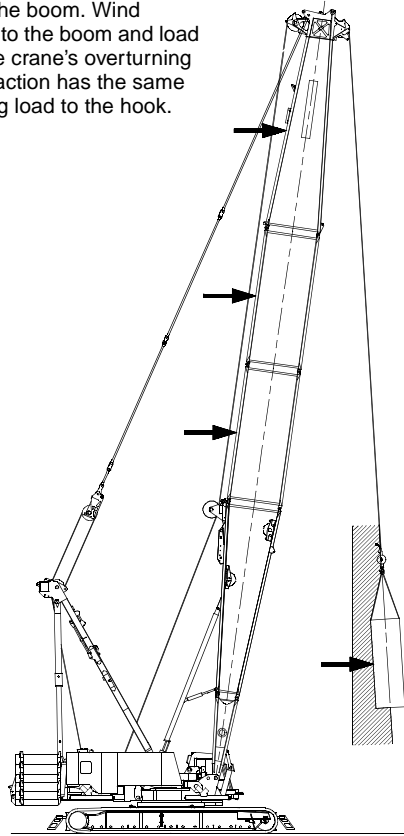
Wind speed (to include wind gusts) must be monitored by job planners and supervisors.

Beware that wind speed at the boom or jib point can be greater than wind speed at ground level. Also beware that the larger the sail area of the load, the greater the wind's affect on the load.

As a general rule, ratings and operating speeds must be reduced when:

Wind causes load to swing forward past allowable operating radius or sideways past either boom hinge pin.

Forward stability is affected by wind on the rear of the boom. Wind applies a force to the boom and load that adds to the crane's overturning moment. This action has the same effect as adding load to the hook.



The wind's affect on the rear of the load increases load radius. This condition can result in an overload hazard, possibly causing the crane to tip or the boom to collapse.

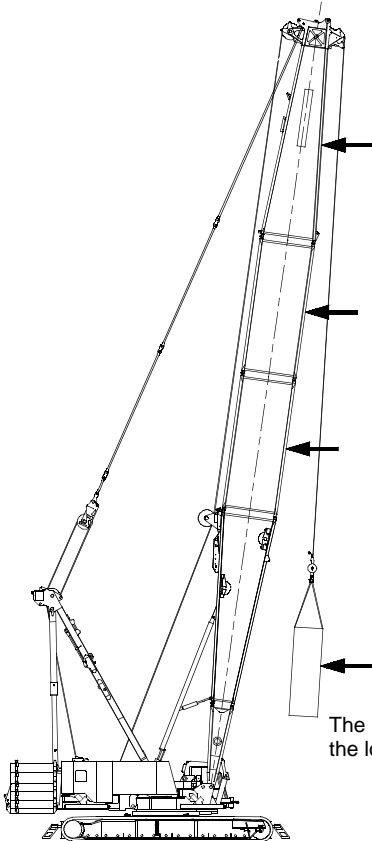
To avoid this hazard, reduce operating speeds and load (see Tables for recommended capacity reductions).

A1074

Backward stability is affected by wind on the front of the boom. This condition is especially dangerous when the boom is at or near the maximum angle when operating without load.

Wind forces on the front of the boom reduce the normal forward tipping effect of the boom. The crane can tip or the boom can collapse if this condition is not avoided.

The boom can buckle and collapse if the load contacts the boom.



Boom strength is affected the most when the wind acts on the side of the boom.

The wind's affect on the side of the load can cause the load to swing out past the boom hinge pin. This condition can result in excessive side load forces on the boom, possibly causing the crane to tip or the boom to collapse.

To avoid this hazard, reduce operating speeds and load (see Tables for recommended capacity reductions).

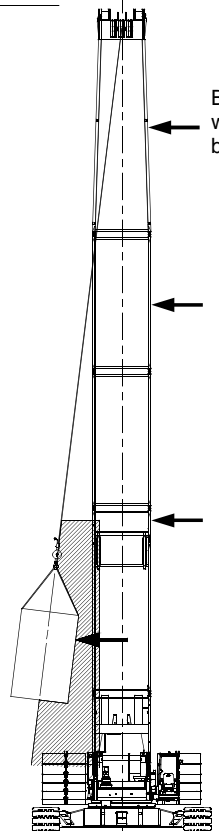


FIGURE 1

Manitowoc Recommendations

Operation Permitted

Operation is permitted in steady winds or wind gusts up to 35 mph (16 m/s). However, ratings must be reduced the amount given in the following tables for the corresponding attachment.

Crane

Tables 1-4 are for cranes without Max-Er Attachment. For Max-Er 225 or 400 Attachment, refer to Tables 5-8.

Table 1

Rating Reductions for Various Wind Speeds and Wind Gusts

WHEN EQUIPPED WITH BOOM ONLY (HEAVY LIFT OR LONG REACH)

Boom Length ft (m)		70–220 (21.3–67.1)	230–260 (70.1–79.2)	270–300 (82.3–91.4)	310–330 (94.5–100.6)
Maximum Wind Speed		Percent Rating Reduction			
mph	m/s				
15	7	0	0	0	0
20	9	0	0	10	10
25	11	0	10	20	30
30	13	0	10	30	40
35	16	0	20	50	60
Above 35 mph (16 m/s)		OPERATION NOT PERMITTED			

For operation in winds above 30 mph (13 m/s) with boom positioned above 80°, load block must weigh at least 4,800 lb (2 177 kg). *Boom may be blown over backwards if this precaution is not observed.*

Table 2

Rating Reductions for Various Wind Speeds and Wind Gusts

WHEN EQUIPPED WITH BOOM (HEAVY LIFT OR LONG REACH) AND FIXED JIB AT ANY OFFSET ANGLE

Fixed Jib Length ft (m)		40–80 (12.2–24.4)	40–80 (12.2–24.4)	100–120 (30.5–36.6)	100–120 (30.5–36.6)
Boom Length ft (m)		130–220 (39.6–67.1)	230–280 (70.1–85.3)	130–220 (39.6–67.1)	230–270 (70.1–82.3)
Maximum Wind Speed		Percent Rating Reduction			
mph	m/s				
15	7	0	0	0	0
20	9	0	10	0	10
25	11	0	10	10	20
30	13	10	20	20	50
35	16	10	40	OPERATION NOT PERMITTED	
Above 35 mph (16 m/s)					

For operation in winds above 20 mph (9 m/s) with boom positioned above 75°, load block from jib point must weigh at least 4,400 lb (1 996 kg). *Fixed jib may be blown over backwards if this precaution is not observed.*

WIND CONDITIONS

Table 3
Rating Reductions for Various Wind Speeds and Wind Gusts
 WHEN EQUIPPED WITH BOOM AND LUFFING JIB

Luffing Jib Length ft (m)		70–120 (21.3–36.6)	70–120 (21.3–36.6)	70–120 (21.3–36.6)	130–160 (39.6–48.8)	130–160 (39.6–48.8)	130–160 (39.6–48.8)	170–200 (51.8–61.0)	170–200 (51.8–61.0)	170–200 (51.8–61.0)	
Boom Length ft (m)		80–140 (24.4–42.7)	150–180 (45.7–54.9)	190–210 (57.9–64.0)	80–140 (24.4–42.7)	150–180 (45.7–54.9)	190–210 (57.9–64.0)	80–140 (24.4–42.7)	150–180 (45.7–54.9)	190–200 (57.9–61.0)	
Maximum Wind Speed		Percent Rating Reduction									
mph	m/s										
15	7	0	0	0	0	0	0	0	0	0	
20	9	0	0	0	0	0	0	0	0	40	
25	11	0	0	0	0	0	40	OPERATION NOT PERMITTED			
30	13	0	0	10	20						
35	16	0	10	50							
Above 35 mph (16 m/s)		OPERATION NOT PERMITTED									

For operation in winds above 20 mph (9 m/s) with luffing jib positioned above 60°, load block from jib point must weigh at least 4,800 lb (2 177 kg). *Luffing jib may be blown over backwards if this precaution is not observed.*

Table 4
Rating Reductions for Various Wind Speeds and Wind Gusts
 WHEN EQUIPPED WITH BOOM, LUFFING JIB, AND FIXED JIB

Total Combination ft (m)		380–420 (115.9–128.0)	430–520 (131.1–158.5)
Maximum Wind Speed		Percent Rating Reduction	
mph	m/s		
15	7	0	0
20	9	0	OPERATION NOT PERMITTED
Above 20 mph (9 m/s)			

For operation in winds above 15 mph (7 m/s) with luffing jib positioned above 65°, load block or weight ball from fixed jib point must weigh at least 1,900 lb (862 kg). *Fixed jib may be blown over backwards if this precaution is not observed.*

Max-Er Attachment

Tables 5-8 are for cranes with Max-Er 225 or 400 Attachment. For cranes without Max-Er Attachment, refer to Tables 1-4.

Table 5
Rating Reductions for Various Wind Speeds and Wind Gusts
WHEN EQUIPPED WITH BOOM ONLY

Boom Length ft (m)		140–280 (42.7–85.3)	300–320 (91.4–97.5)	340 (103.6)
Maximum Wind Speed		Percent Rating Reduction		
mph	m/s			
15	7	0	0	0
20	9	0	0	0
25	11	0	0	0
30	13	0	0	10
35	16	0	10	30
Above 35 mph (16 m/s)		OPERATION NOT PERMITTED		

For operation in winds above 30 mph (13 m/s) with boom positioned above 80°, load block must weigh at least 8,000 lb (3 629 kg). *Boom may be blown over backwards if this precaution is not observed.*

Table 6
Rating Reductions for Various Wind Speeds and Wind Gusts
WHEN EQUIPPED WITH BOOM AND FIXED JIB AT ANY OFFSET ANGLE

Fixed Jib Length ft (m)		40–80 (12.2–24.4)	40–80 (12.2–24.4)	100–120 (30.5–36.6)	100–120 (30.5–36.6)
Boom Length ft (m)		140–280 (42.7–85.3)	300–340 (91.4–103.6)	140–280 (42.7–85.3)	300–340 (91.4–103.6)
Maximum Wind Speed		Percent Rating Reduction			
mph	m/s				
15	7	0	0	0	0
20	9	0	0	0	10
25	11	0	10	10	20
30	13	10	20	20	30
35	16	10	20	30	
Above 35 mph (16 m/s)		OPERATION NOT PERMITTED			

For operation in winds above 20 mph (9 m/s) with boom positioned above 75°, load block from jib point must weigh at least 4,800 lb (2 177 kg). *Fixed jib may be blown over backwards if this precaution is not observed.*

WIND CONDITIONS

Table 7
Rating Reductions for Various Wind Speeds and Wind Gusts
WHEN EQUIPPED WITH BOOM AND LUFFING JIB

Luffing Jib Length ft (m)		70–120 (21.3–36.6)	70–120 (21.3–36.6)	70–120 (21.3–36.6)	130–180 (39.6–54.9)	130–180 (39.6–54.9)	130–180 (39.6–54.9)	190–200 (57.9–61.0)	190–200 (57.9–61.0)	190–200 (57.9–61.0)
Boom Length ft (m)		140–180 (42.7–54.9)	200–260 (61.0–79.2)	280–340 (85.3–103.6)	140–180 (42.7–54.9)	200–260 (61.0–79.2)	280–340 (85.3–103.6)	140–180 (42.7–54.9)	200–260 (61.0–79.2)	280–340 (85.3–103.6)
Maximum Wind Speed		Percent Rating Reduction								
mph	m/s									
15	7	0	0	0	0	0	0	0	0	0
20	9	0	0	0	0	0	0	0	0	0
25	11	0	0	0	0	0	0	0	0	0
30	13	0	0	0	0	10	30	10	40	
35	16	0	0	0	0	50		10		
Above 35 mph (16 m/s)		OPERATION NOT PERMITTED								

For operation in winds above 20 mph (9 m/s) with luffing jib positioned above 60°, load block from jib point must weigh at least 6,100 lb (2 767 kg). *Luffing jib may be blown over backwards if this precaution is not observed.*

Table 8
Rating Reductions for Various Wind Speeds and Wind Gusts
WHEN EQUIPPED WITH BOOM, LUFFING JIB, AND FIXED JIB

Total Combination ft (m)		460–520 (140.2–158.5)	540–620 (164.6–189.0)
Maximum Wind Speed		Percent Rating Reduction	
mph	m/s		
15	7	0	0
20	9	0	0
25	11	0	
Above 25 mph (11 m/s)		OPERATION NOT PERMITTED	

For operation in winds above 15 mph (7 m/s) with luffing jib positioned above 65°, load block or weight ball from fixed jib point must weigh at least 1,900 lb (862 kg). *Fixed jib may be blown over backwards if this precaution is not observed.*

Operation Not Permitted

NOTE: For special conditions not covered below, contact Technical Services Department at factory.

Boom, Boom with Fixed Jib, or Boom with Luffing Jib

- Up to 50 mph (22 m/s) —

For boom or boom and fixed jib, park crane (upper in line with crawlers) with load blocks and weight balls on ground or secured and position boom no higher than 70°.

For boom and luffing jib, park crane (upper in line with crawlers) with load blocks and weight balls on ground or secured and position boom at 75° and luffing jib at 45°.

- 50 mph (22 m/s) and Above —

Lower boom and jib onto blocking at ground level.

Boom with Luffing Jib and Fixed Jib

- Up to 40 mph (18 m/s) —

Park crane (upper in line with crawlers) with load blocks and weight balls on ground or secured and position boom at 75° and luffing jib at 45°.

- 40 mph (18 m/s) and Above —

Lower boom and jibs onto blocking at ground level.

NOTE: **Above 50 mph (22 m/s)** for Max-Er only, haul in boom hoist wire rope just enough to tension mast backhitch. Do not raise boom off blocking. *Wind can cause mast backhitch to collapse if this step is not performed.*

Above 75 mph (34 m/s), lower mast onto blocking at ground level.