



preliminary

# MK 140-5.1

Technical data • Datos técnicos

## LIEBHERR

MK Mobile construction cranes



Up to 90 % CO<sub>2</sub> emissions reduction  
**HVO ready**



# **MK 140-5.1**

|                                                         |           |
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# Highlights



[WWW.LIEBHERR.COM/MK](http://WWW.LIEBHERR.COM/MK)



**The taxi crane: several operations in one day without additional logistical effort.**  
Grúa taxi: varias operaciones en un solo día sin un esfuerzo logístico adicional.

## ECOdrive

**Smart assistance systems for simple and safe operation.**  
Sistemas de asistencia inteligentes para un manejo sencillo y seguro.



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**Specially designed for densely populated inner cities: work close to the building thanks to compact dimensions and various luffed positions.**

Ideal para centros de ciudades densamente pobladas: trabajos en las inmediaciones de edificios con medidas compactas y con distintas posiciones de inclinación.



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**Electrically operated crane with hybrid current supply. Emission-free operation to reduce environmental impact.**

Grúa de accionamiento eléctrico con alimentación de corriente híbrida. Servicio sin emisiones para proteger el medioambiente.

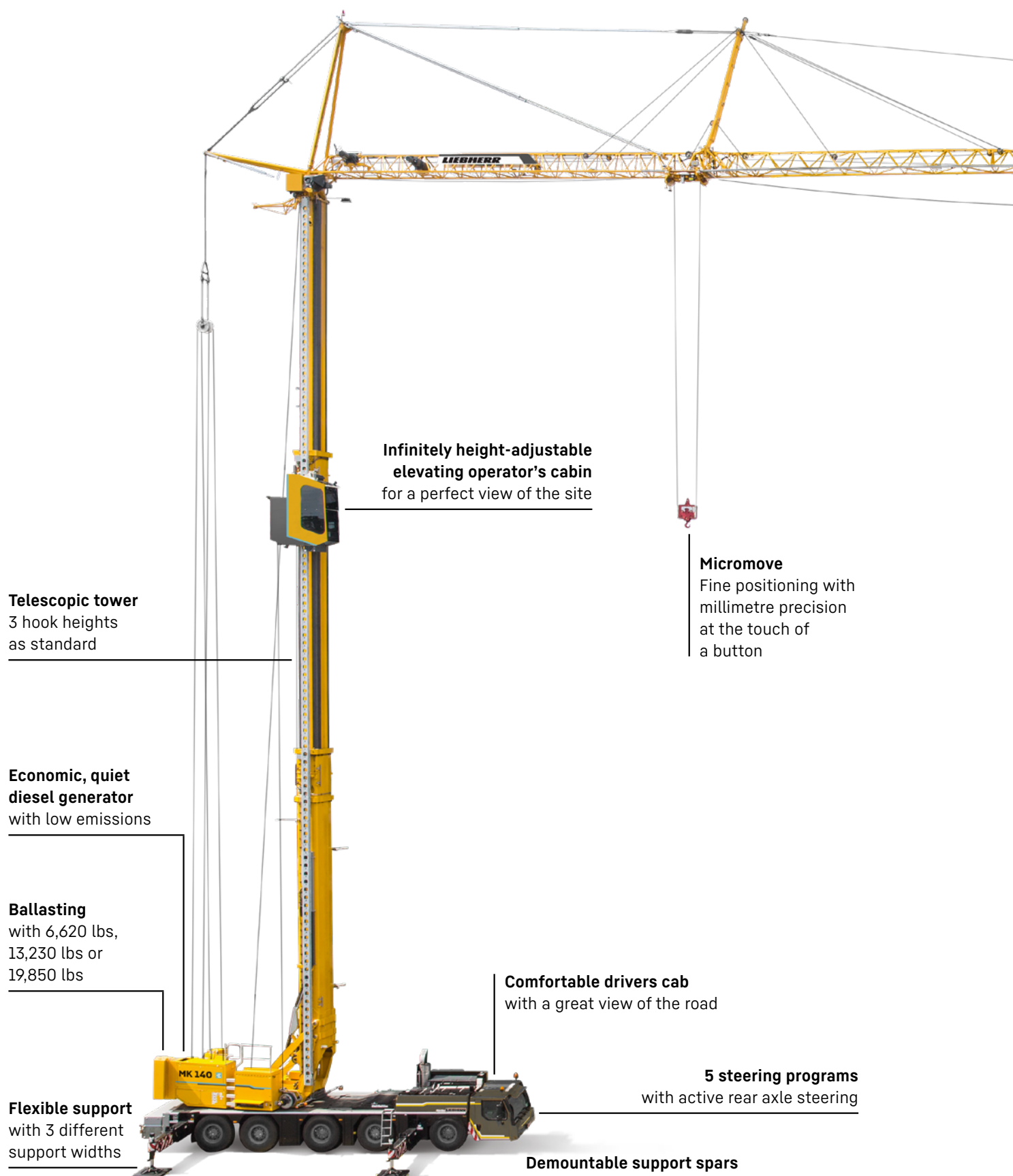
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**Height-adjustable elevating operator's cab offers perfect visibility of the load.**

La cabina de elevación con ajuste de altura ofrece una vista perfecta de la carga.



# MK 140-5.1



**Infinitely height-adjustable  
elevating operator's cabin**  
for a perfect view of the site

**Telescopic tower**  
3 hook heights  
as standard

**Economic, quiet  
diesel generator**  
with low emissions

**Ballasting**  
with 6,620 lbs,  
13,230 lbs or  
19,850 lbs

**Flexible support**  
with 3 different  
support widths

**Micromove**  
Fine positioning with  
millimetre precision  
at the touch of  
a button

**Comfortable drivers cab**  
with a great view of the road

**5 steering programs**  
with active rear axle steering

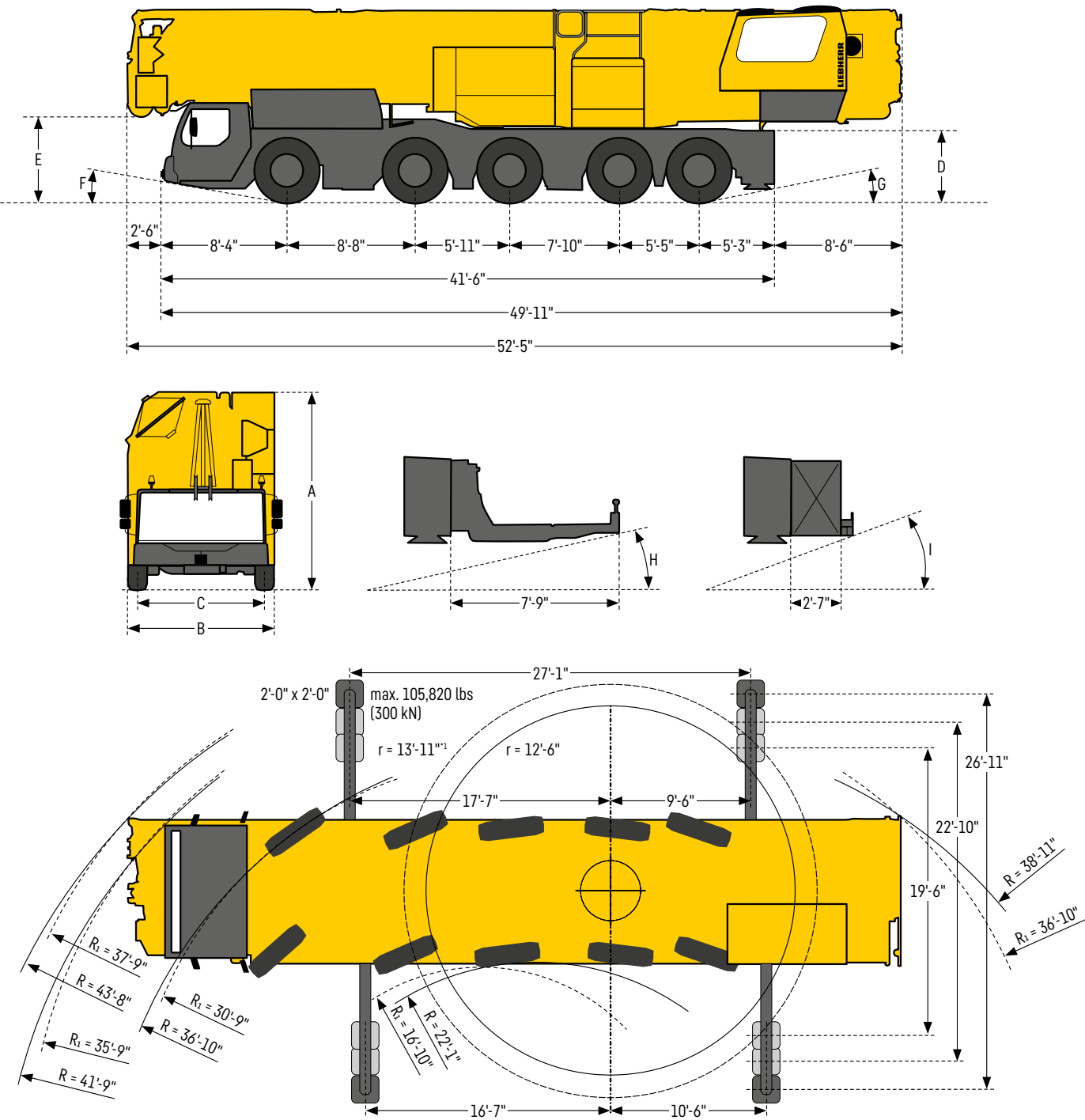
**Demountable support spars**



**VarioJib**  
for the flexible use of  
trolley and luffing mode

**Lattice jib heads  
for luffing mode**  
Jib length up to 213 ft  
Hook height up to 310 ft

Dimensions • Dimensiones



<sup>\*1</sup> With 19,850 lbs additional ballast • Con 19.850 lbs de lastre adicional

R<sub>1</sub> = All-wheel steering • Dirección en todos los ejes

Dimensions • Dimensiones

|                          | A      | A<br>0'-4"* | B      | C     | D     | E      | F     | G     | H    | I     |
|--------------------------|--------|-------------|--------|-------|-------|--------|-------|-------|------|-------|
| 385/95 R 25 (14.00 R 25) | 13'-1" | 12'-10"     | 9'-10" | 8'-7" | 4'-6" | 5'-11" | 12.0° | 13.0° | 7.0° | 12.0° |

\* lowered • suspensión abajo

Standard dimensions, country-specific versions on request. • Medidas estándar, versiones de países bajo petición.

## Weights • Pesos



### Hook block • Pastecas

|  | 3,750 lbs  |  |                     |
|-----------------------------------------------------------------------------------|------------|-----------------------------------------------------------------------------------|---------------------|
|                                                                                   |            | D = 0'-9"                                                                         |                     |
|  | 17,640 lbs | L = 2'-5" B = 0'-11"                                                              |                     |
|                                                                                   |            | 320 lbs                                                                           | VarioJib (HCL-Mode) |
|                                                                                   |            | 480 lbs                                                                           | Trolley Mode        |

Load capacity figures net, hook block can be ignored. • Indicaciones de carga neta; no es preciso tomar en consideración la garrucha de gancho.

## Working speeds • Velocidades



### Crane carrier • Chasis

|                                                                                   | min. | mph | мин. | max. | mph | макс. | %     |                                                                                     |                                                                                     |
|-----------------------------------------------------------------------------------|------|-----|------|------|-----|-------|-------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |      |     |      |      |     |       |       |                                                                                     |                                                                                     |
| 385/95 R 25 (14.00 R 25)                                                          | 0.27 |     |      | 49.6 |     |       | > 60% |  |  |
|                                                                                   |      |     |      |      |     |       |       |  | 12 / R2                                                                             |
|                                                                                   |      |     |      |      |     |       |       |  | 4 / R2                                                                              |

Theoretical gradeability • Capacidad de traslación teórica en pendiente



### Crane superstructure • Superestructura

|                                                                                     | ft/min  |                                                                                     |                                                                                       |               |
|-------------------------------------------------------------------------------------|---------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------|
|  | 0 - 358 | ft/min for 2-fall • ft/min para 2 ramales                                           |  | 13 mm         |
|  | 0 - 262 | ft/min                                                                              | 8 mm                                                                                  | 804 ft        |
|  | 0 - 0.9 | min <sup>-1</sup>                                                                   |                                                                                       | 393 ft/207 ft |
|  | 16:55   | min from supported state • min desde posición apoyada                               |                                                                                       |               |
|  | 1:55    | min from 0° to 45° jib position • min de 0° a 45° en posición inclinada de la pluma |                                                                                       |               |

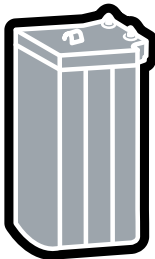
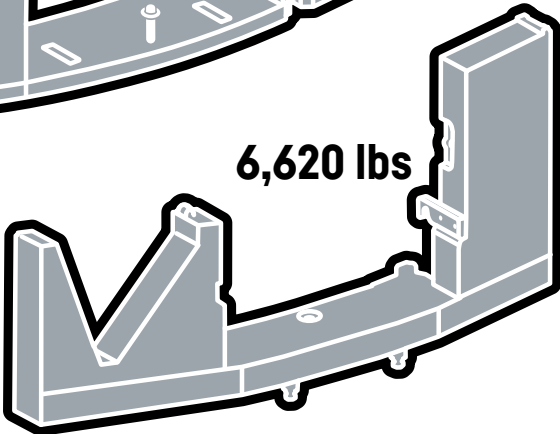
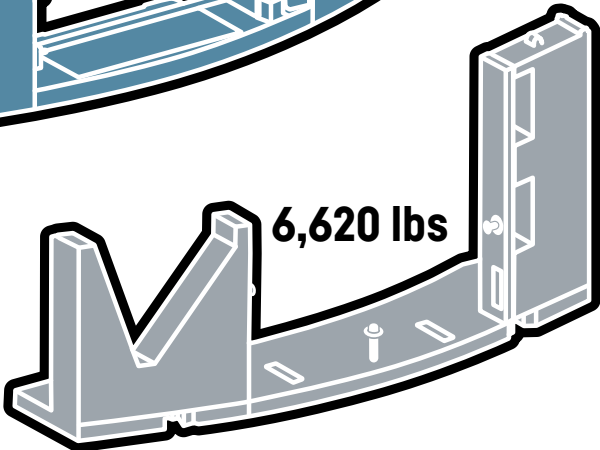
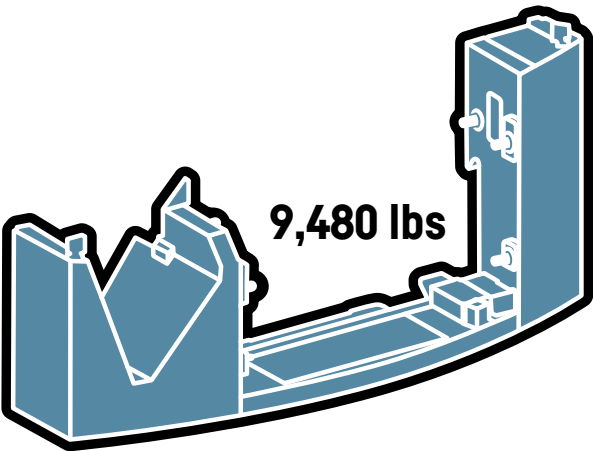
## Power supply • Fuente de alimentación



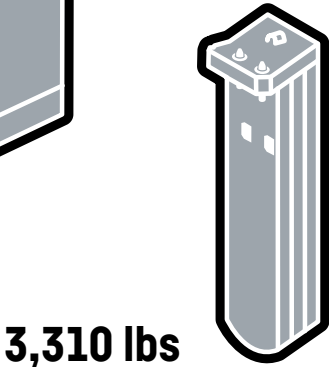
### Electrical power connection • Toma de corriente

|          |                                                                                                                     | RCD          | U           | f        | P      |
|----------|---------------------------------------------------------------------------------------------------------------------|--------------|-------------|----------|--------|
| CEE 63 A |  420 ft - 5 x 16 mm <sup>2</sup> | Typ B/300 mA | 380 - 480 V | 50/60 Hz | 46 kVA |

Counterweight - Lastre



3,310 lbs

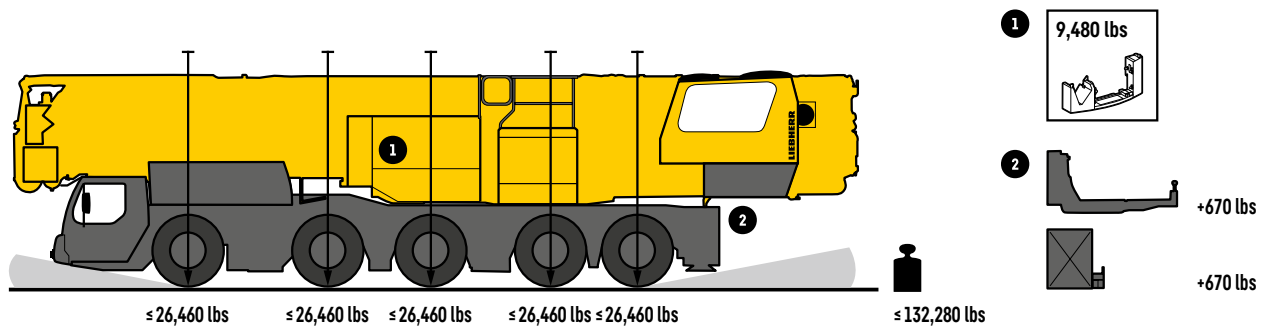


26,460 lbs axle load  
26.460 lbs de peso por eje

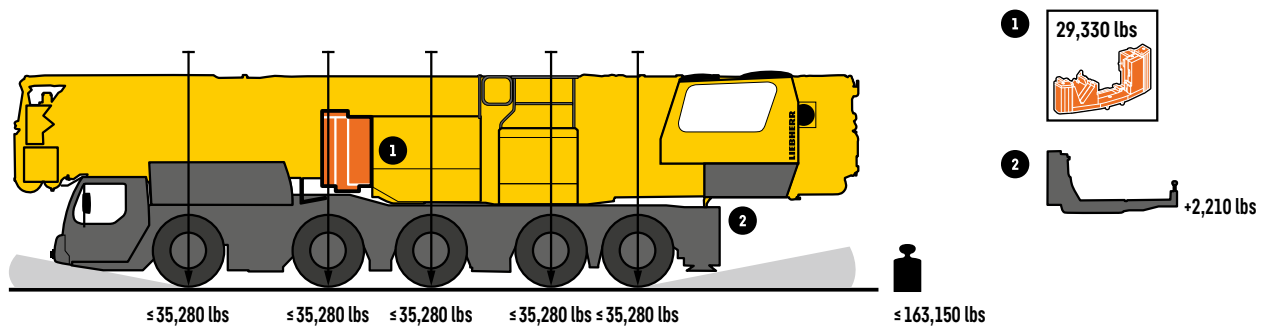
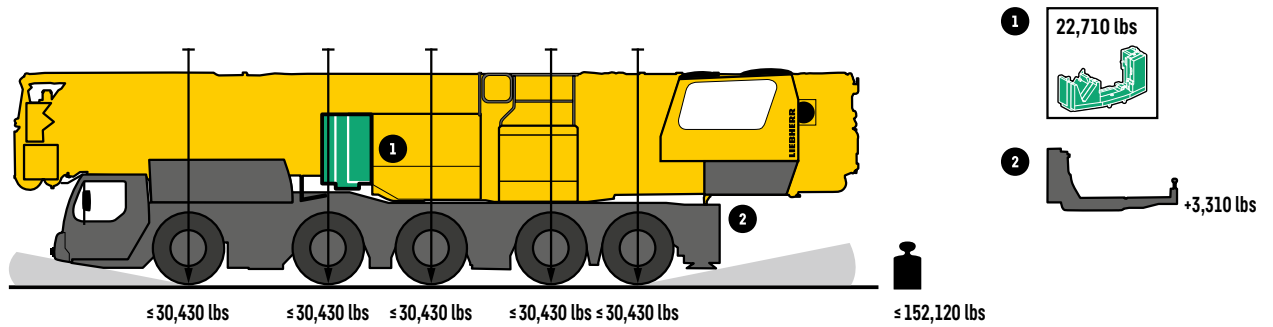
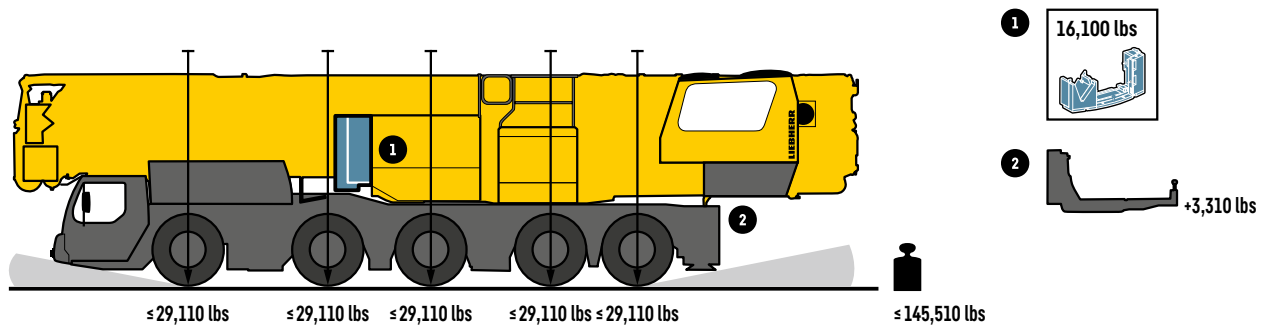


Technically transportable  
Técnicamente transportable

## On-road driving · Marcha por carreteras



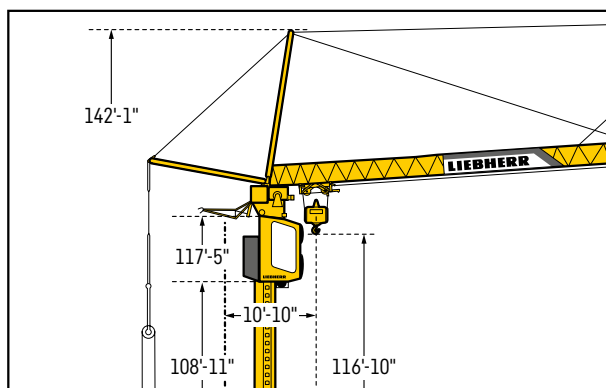
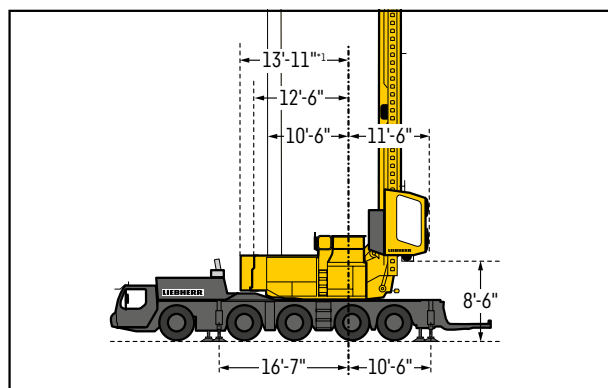
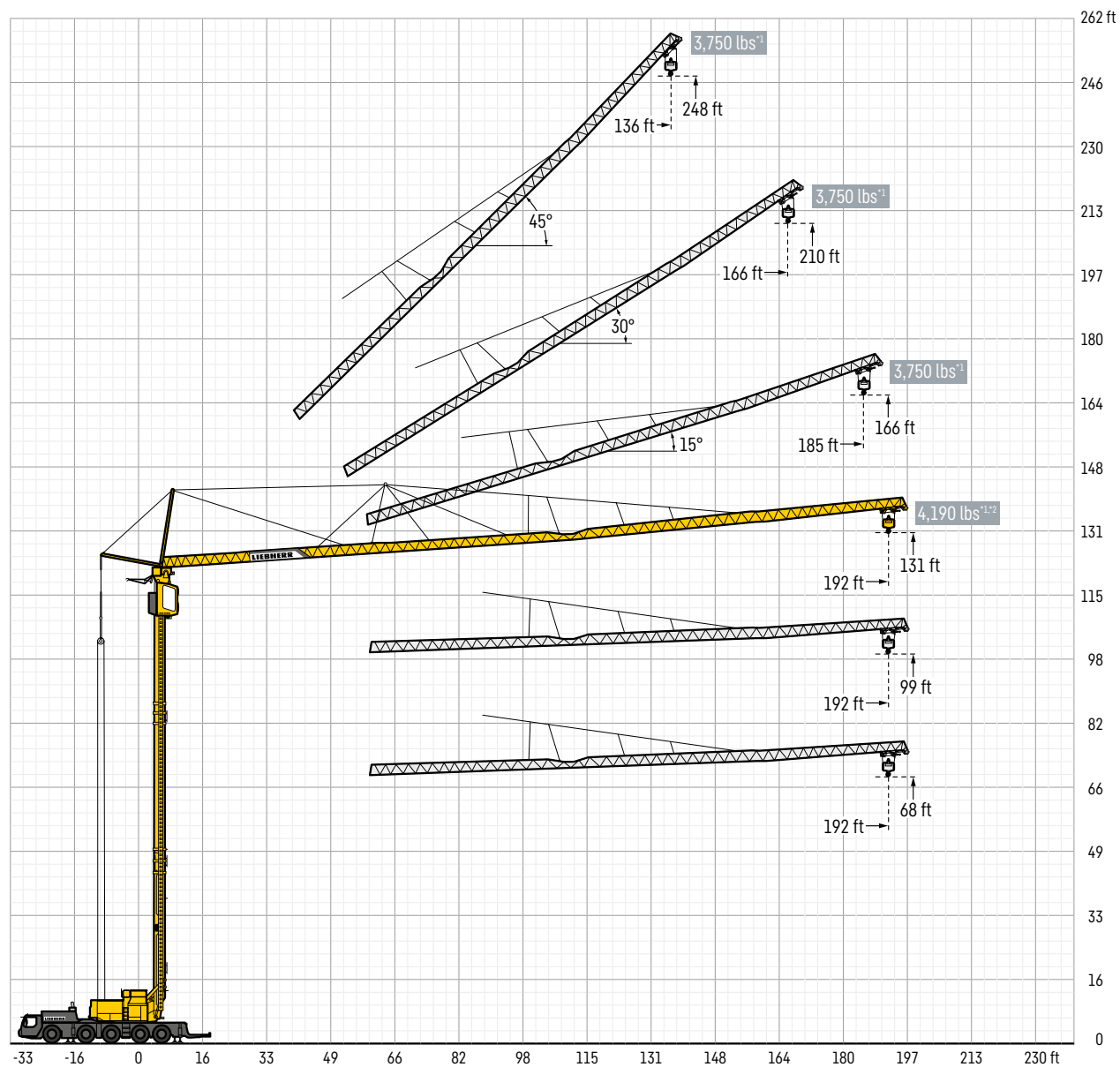
## Jobsite driving · Marcha en obra



For road transport observe country-specific regulations. · Para el transporte por carretera observar las regulaciones de tráfico nacionales.

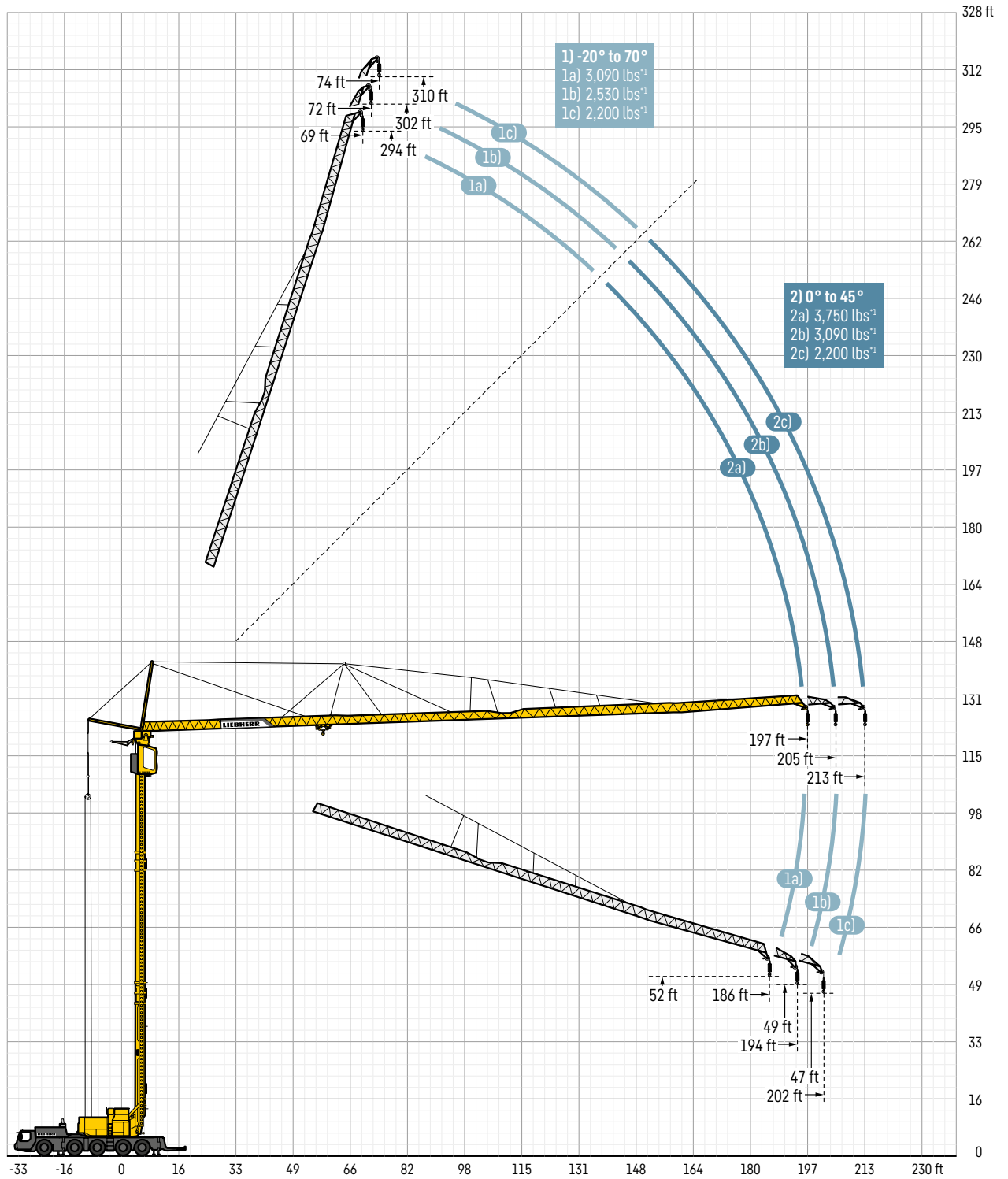
# VarioJib

## Trolley mode · Modo de traslación de carro



# VarioJib

## Luffing mode - Modo basculante



<sup>1</sup> With 19,850 lbs additional ballast - Con 19.850 lbs de lastre adicional

<sup>2</sup> Plus load curves with control limitations in comparison to standard load curve. See the operating manual for more details.

Curva de carga Plus con limitaciones técnicas respecto a la curva de carga estándar. Indicaciones en detalle al respecto en el manual de instrucciones.

## Luffing mode - Modo basculante



26'-11" x 27'-1"

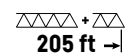


|             |  | 70°<br>69 ft | 45°<br>141 ft | 0°<br>197 ft | -20°<br>186 ft |
|-------------|--|--------------|---------------|--------------|----------------|
| +0 lbs      |  | 1,210        | 1,760         | 1,760        |                |
| +6,620 lbs  |  | 1,760        | 2,540         | 2,540        |                |
| +13,230 lbs |  | 2,540        | 3,090         | 3,090        |                |
| +19,850 lbs |  | 3,090        | 3,750         | 3,750        |                |

→ lbs



26'-11" x 27'-1"

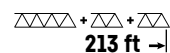


|             |  | 70°<br>72 ft | 45°<br>147 ft | 0°<br>205 ft | -20°<br>194 ft |
|-------------|--|--------------|---------------|--------------|----------------|
| +0 lbs      |  | 660          | 1,430         | 660          |                |
| +6,620 lbs  |  | 1,430        | 1,760         | 1,430        |                |
| +13,230 lbs |  | 1,760        | 2,540         | 1,760        |                |
| +19,850 lbs |  | 2,540        | 3,090         | 2,540        |                |

→ lbs



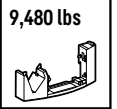
26'-11" x 27'-1"



|             |  | 70°<br>74 ft | 45°<br>153 ft | 0°<br>213 ft | -20°<br>202 ft |
|-------------|--|--------------|---------------|--------------|----------------|
| +0 lbs      |  |              |               | 660          |                |
| +6,620 lbs  |  |              |               | 1,210        |                |
| +13,230 lbs |  |              |               | 1,760        |                |
| +19,850 lbs |  |              |               | 2,200        |                |

→ lbs

## Trolley mode – standard - Modo de traslación de carro – estándar



26'-11" x 27'-1"

|  $\alpha^\circ$ |  ft $\rightarrow$ |  | ft       | lbs    | ft                                                                                      |        |        |        |        |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |
|--------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------|--------|-----------------------------------------------------------------------------------------|--------|--------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|
|                                                                                                  |                                                                                                    |                                                                                   |          |        | 10                                                                                      | 20     | 29     | 39     | 49     | 59    | 69    | 79    | 89    | 98    | 108   | 118   | 128   | 138   | 148   | 157   | 167   | 177   | 187   | 192   |  |
| 0°                                                                                               | 192                                                                                                |  | 11 - 34  | 17,640 | 17,640                                                                                  |        | 14,950 | 11,570 | 9,390  | 7,850 | 6,720 | 5,860 | 5,160 | 4,610 | 4,140 | 3,750 | 3,420 | 3,130 | 2,870 | 2,650 | 2,450 | 2,270 | 2,200 |       |  |
|                                                                                                  |                                                                                                    |  | 11 - 27  | 17,640 | 17,640                                                                                  | 15,610 | 11,240 | 8,710  | 7,050  | 5,890 | 5,030 | 4,370 | 3,840 | 3,400 | 3,040 | 2,730 | 2,470 | 2,250 | 2,050 | 1,900 | 1,740 | 1,590 | 1,540 |       |  |
|                                                                                                  | Plus <sup>2</sup>                                                                                  |  | 11 - 39  | 17,640 | 17,640                                                                                  |        | 13,400 |        | 10,740 | 8,910 | 7,580 | 6,570 | 5,780 | 5,140 | 4,610 | 4,140 | 3,770 | 3,460 | 3,170 | 2,910 | 2,710 | 2,510 | 2,430 |       |  |
| 15°                                                                                              | 185                                                                                                |  | 10 - 112 | 3,970  | 3,970                                                                                   |        |        |        |        |       |       |       |       |       |       | 3,680 |       | 3,310 | 3,000 | 2,730 | 2,490 | 2,290 | 2,120 | 1,980 |  |
|                                                                                                  |                                                                                                    |  | 10 - 87  | 3,970  | 3,970                                                                                   |        |        |        |        |       |       | 3,860 |       | 3,370 | 2,950 | 2,620 | 2,340 | 2,090 | 1,900 | 1,720 | 1,570 | 1,410 | 1,320 |       |  |
|                                                                                                  | Plus                                                                                               |  | 10 - 86  | 5,510  | 5,510                                                                                   |        |        |        |        |       |       | 5,290 |       | 4,650 | 4,120 | 3,680 | 3,330 | 3,000 | 2,730 | 2,510 | 2,290 | 2,120 | 1,980 |       |  |
|                                                                                                  |                                                                                                    |  | 10 - 67  | 5,510  | 5,510                                                                                   |        |        |        |        | 5,360 | 4,520 | 3,880 | 3,370 | 2,980 | 2,650 | 2,360 | 2,120 | 1,920 | 1,720 | 1,570 | 1,430 | 1,320 |       |       |  |
| 30°                                                                                              | 166                                                                                                |  | 10 - 39  | 13,230 | 13,230                                                                                  |        | 10,160 | 8,200  | 6,810  | 5,800 | 5,030 | 4,410 | 3,900 | 3,510 | 3,150 | 2,840 | 2,600 | 2,380 | 2,200 |       |       |       |       |       |  |
|                                                                                                  |                                                                                                    |  | 10 - 29  | 13,230 | 13,230                                                                                  | 9,440  | 7,250  | 5,820  | 4,830  | 4,100 | 3,530 | 3,060 | 2,690 | 2,380 | 2,140 | 1,920 | 1,720 | 1,570 | 1,430 |       |       |       |       |       |  |
| 45°                                                                                              | 136                                                                                                |  | 9 - 102  | 3,970  | 3,970                                                                                   |        |        |        |        |       |       |       |       |       |       | 3,640 |       | 3,220 | 2,890 | 2,650 |       |       |       |       |  |
|                                                                                                  |                                                                                                    |  | 9 - 82   | 3,970  | 3,970                                                                                   |        |        |        |        |       |       | 3,550 |       | 3,060 | 2,670 | 2,340 | 2,070 | 1,870 |       |       |       |       |       |       |  |
|                                                                                                  | Plus                                                                                               |  | 9 - 76   | 5,840  | 5,840                                                                                   |        |        |        |        |       |       | 5,580 |       | 4,780 | 4,170 | 3,660 | 3,240 | 2,910 | 2,650 |       |       |       |       |       |  |
|                                                                                                  |                                                                                                    |  | 9 - 62   | 5,840  | 5,840                                                                                   |        |        |        |        | 5,050 | 4,210 | 3,570 | 3,060 | 2,670 | 2,340 | 2,070 | 1,870 |       |       |       |       |       |       |       |  |
|                                                                                                  |                                                                                                    |                                                                                   |          |        |  lbs |        |        |        |        |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |

→ lbs



22'-10" x 27'-1"

| <br>α° | <br>ft → |    | ft      | lbs    | ft     |        |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |     |
|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------|--------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-----|
|                                                                                         |                                                                                           |                                                                                     |         |        | 10     | 20     | 29    | 39    | 49    | 59    | 69    | 79    | 89    | 98    | 108   | 118   | 128   | 138   | 148   | 157   | 167   | 177   | 187 |
| 0°                                                                                      | 192                                                                                       |    | 11 – 21 | 17,640 | 17,640 | 11,970 | 8,530 | 6,550 | 5,250 | 4,340 | 3,680 | 3,150 | 2,760 | 2,430 | 2,140 | 1,920 | 1,700 | 1,540 | 1,390 | 1,260 | 1,120 | 1,040 | 990 |
|                                                                                         |                                                                                           |   | 11 – 13 | 17,640 | 17,640 | 11,420 | 7,160 | 5,110 | 3,880 | 3,060 | 2,490 | 2,070 | 1,740 | 1,480 | 1,260 | 1,080 | 930   | 790   | 680   | 600   | 510   | 420   | 350 |
| 15°                                                                                     | 185                                                                                       |  | 10 – 66 | 3,970  | 3,970  |        |       |       |       | 3,700 | 3,110 | 2,650 | 2,270 | 1,980 | 1,740 | 1,520 | 1,340 | 1,190 | 1,060 | 950   | 840   | 770   |     |
|                                                                                         |                                                                                           |  | -       | -      |        |        |       |       |       | -     |       |       |       |       |       |       |       |       |       |       |       |       |     |
|                                                                                         | Plus                                                                                      |  | 10 – 50 | 5,510  | 5,510  |        |       |       | 4,540 | 3,730 | 3,110 | 2,650 | 2,290 | 1,980 | 1,740 | 1,540 | 1,370 | 1,210 | 1,080 | 950   | 860   | 770   |     |
|                                                                                         |                                                                                           |  | -       | -      |        |        |       |       |       |       |       |       |       |       |       | -     |       |       |       |       |       |       |     |
| 30°                                                                                     | 166                                                                                       |  | 10 – 23 | 13,230 | 9,790  | 6,940  | 5,290 | 4,210 | 3,460 | 2,910 | 2,470 | 2,120 | 1,850 | 1,610 | 1,410 | 1,230 | 1,100 | 970   | 880   |       |       |       |     |
|                                                                                         |                                                                                           |  | -       | -      |        |        |       |       |       |       |       |       |       |       |       | -     |       |       |       |       |       |       |     |
| 45°                                                                                     | 136                                                                                       |  | 9 – 62  | 3,970  | 3,970  |        |       |       |       | 3,460 | 2,870 | 2,430 | 2,070 | 1,790 | 1,540 | 1,340 | 1,210 |       |       |       |       |       |     |
|                                                                                         |                                                                                           |  | 9 – 82  | -      |        |        |       |       |       |       |       |       |       |       |       | -     |       |       |       |       |       |       |     |
|                                                                                         | Plus                                                                                      |  | 9 – 47  | 5,840  | 5,840  |        |       | 5,450 | 4,280 | 3,460 | 2,870 | 2,430 | 2,070 | 1,790 | 1,570 | 1,370 | 1,210 |       |       |       |       |       |     |
|                                                                                         |                                                                                           |  | -       | -      |        |        |       |       |       |       |       |       |       |       |       | -     |       |       |       |       |       |       |     |
|                                                                                         |                                                                                           |                                                                                     |         |        | lbs →  |        |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |     |

→ lbs



19'-6" x 27'-1"

No lifting capacity diagrams are available for this configuration. The crane can be ballasted. See the operating manual for more details.

No hay curvas de carga disponibles para este estado de equipamiento esta configuración. Es posible el lastrado de la grúa. Indicaciones en detalle al respecto en el manual de instrucciones.

# Trolley mode – with additional ballast (6,620 lbs)

Modo de traslación de carro – con lastre adicional (6.620 lbs)

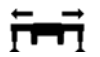
16,100 lbs



26'-11" x 27'-1"

| <br>$\alpha^\circ$ | <br>ft → |  |          | ft     | lbs    | ft                                                                                      |        |        |        |        |       |       |       |       |       |       |       |       |       |       |       |       |       |       |     |  |
|-----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------|--------|--------|-----------------------------------------------------------------------------------------|--------|--------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-----|--|
|                                                                                                     |                                                                                           |                                                                                   |          |        |        | 10                                                                                      | 20     | 29     | 39     | 49     | 59    | 69    | 79    | 89    | 98    | 108   | 118   | 128   | 138   | 148   | 157   | 167   | 177   | 187   | 192 |  |
| 0°                                                                                                  | 192                                                                                       |  | 11 - 39  | 17,640 | 17,640 |                                                                                         |        | 13,760 | 11,220 | 9,440  | 8,110 | 7,100 | 6,280 | 5,620 | 5,070 | 4,590 | 4,190 | 3,860 | 3,550 | 3,280 | 3,040 | 2,840 | 2,760 |       |     |  |
|                                                                                                     |                                                                                           |  | 11 - 32  | 17,640 | 17,640 |                                                                                         | 14,260 | 11,180 | 9,150  | 7,720  | 6,640 | 5,800 | 5,110 | 4,560 | 4,120 | 3,730 | 3,400 | 3,110 | 2,870 | 2,650 | 2,450 | 2,270 | 2,200 |       |     |  |
|                                                                                                     | Plus <sup>2</sup>                                                                         |  | 11 - 44  | 17,640 | 17,640 |                                                                                         |        | 15,540 | 12,540 | 10,470 | 8,950 | 7,800 | 6,900 | 6,170 | 5,580 | 5,070 | 4,630 | 4,250 | 3,950 | 3,660 | 3,400 | 3,170 | 3,090 |       |     |  |
| 15°                                                                                                 | 185                                                                                       |  | 10 - 134 | 3,970  | 3,970  |                                                                                         |        |        |        |        |       |       |       |       |       |       |       |       | 3,840 | 3,530 | 3,260 | 3,020 | 2,800 | 2,650 |     |  |
|                                                                                                     |                                                                                           |  | 10 - 110 | 3,970  | 3,970  |                                                                                         |        |        |        |        |       |       |       |       |       |       | 3,620 | 3,260 | 2,980 | 2,710 | 2,490 | 2,290 | 2,120 | 1,980 |     |  |
|                                                                                                     | Plus                                                                                      |  | 10 - 102 | 5,510  | 5,510  |                                                                                         |        |        |        |        |       |       |       |       |       | 5,140 | 4,630 | 4,210 | 3,860 | 3,550 | 3,260 | 3,020 | 2,800 | 2,650 |     |  |
|                                                                                                     |                                                                                           |  | 10 - 84  | 5,510  | 5,510  |                                                                                         |        |        |        |        |       |       | 5,160 | 4,540 | 4,060 | 3,640 | 3,280 | 2,980 | 2,730 | 2,490 | 2,290 | 2,120 | 1,980 |       |     |  |
| 30°                                                                                                 | 166                                                                                       |  | 10 - 46  | 13,230 | 13,230 |                                                                                         |        | 12,240 | 9,940  | 8,360  | 7,160 | 6,240 | 5,510 | 4,920 | 4,410 | 4,010 | 3,640 | 3,330 | 3,060 | 2,870 |       |       |       |       |     |  |
|                                                                                                     |                                                                                           |  | 10 - 38  | 13,230 | 13,230 |                                                                                         | 12,590 | 9,810  | 7,960  | 6,680  | 5,710 | 4,960 | 4,370 | 3,880 | 3,480 | 3,130 | 2,840 | 2,580 | 2,380 | 2,200 |       |       |       |       |     |  |
| 45°                                                                                                 | 136                                                                                       |  | 9 - 122  | 3,970  | 3,970  |                                                                                         |        |        |        |        |       |       |       |       |       |       |       | 3,730 | 3,420 |       |       |       |       |       |     |  |
|                                                                                                     |                                                                                           |  | 9 - 102  | 3,970  | 3,970  |                                                                                         |        |        |        |        |       |       |       |       |       | 3,640 | 3,220 | 2,890 | 2,650 |       |       |       |       |       |     |  |
|                                                                                                     | Plus                                                                                      |  | 9 - 90   | 5,840  | 5,840  |                                                                                         |        |        |        |        |       |       |       | 5,220 | 4,630 | 4,140 | 3,730 | 3,420 |       |       |       |       |       |       |     |  |
|                                                                                                     |                                                                                           |  | 9 - 76   | 5,840  | 5,840  |                                                                                         |        |        |        |        |       | 5,580 | 4,780 | 4,170 | 3,660 | 3,240 | 2,910 | 2,650 |       |       |       |       |       |       |     |  |
|                                                                                                     |                                                                                           |                                                                                   |          |        |        |  lbs |        |        |        |        |       |       |       |       |       |       |       |       |       |       |       |       |       |       |     |  |

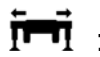
→ lbs



22'-10" x 27'-1"

| <br>α° | <br>ft → |    | ft      | lbs    | ft     |        |        |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------|--------|--------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                                                                                         |                                                                                           |                                                                                     |         |        | 10     | 20     | 29     | 39    | 49    | 59    | 69    | 79    | 89    | 98    | 108   | 118   | 128   | 138   | 148   | 157   | 167   | 177   | 187   |
| 0°                                                                                      | 192                                                                                       |    | 11 - 28 | 17,640 | 17,640 | 16,160 | 11,600 | 8,970 | 7,250 | 6,040 | 5,140 | 4,450 | 3,900 | 3,460 | 3,090 | 2,780 | 2,510 | 2,270 | 2,070 | 1,900 | 1,740 | 1,590 | 1,540 |
|                                                                                         |                                                                                           |   | 11 - 20 | 17,640 | 17,640 | 11,460 | 8,310  | 6,440 | 5,200 | 4,320 | 3,660 | 3,150 | 2,760 | 2,430 | 2,140 | 1,920 | 1,720 | 1,540 | 1,390 | 1,260 | 1,150 | 1,040 | 990   |
| 15°                                                                                     | 185                                                                                       |  | 10 - 90 | 3,970  | 3,970  |        |        |       |       |       |       | 3,550 | 3,130 | 2,780 | 2,490 | 2,250 | 2,030 | 1,850 | 1,680 | 1,540 | 1,430 |       |       |
|                                                                                         |                                                                                           |  | 10 - 66 | 3,970  | 3,970  |        |        |       |       | 3,700 | 3,110 | 2,650 | 2,270 | 1,980 | 1,740 | 1,520 | 1,340 | 1,190 | 1,060 | 950   | 840   | 770   |       |
|                                                                                         | Plus                                                                                      |  | 10 - 69 | 5,510  | 5,510  |        |        |       |       | 4,700 | 4,060 | 3,550 | 3,130 | 2,800 | 2,490 | 2,250 | 2,050 | 1,850 | 1,700 | 1,540 | 1,430 |       |       |
|                                                                                         |                                                                                           |  | 10 - 50 | 5,510  | 5,510  |        |        |       | 4,540 | 3,730 | 3,110 | 2,650 | 2,290 | 1,980 | 1,740 | 1,540 | 1,370 | 1,210 | 1,080 | 950   | 860   | 770   |       |
| 30°                                                                                     | 166                                                                                       |  | 10 - 31 | 13,230 | 13,230 |        | 10,030 | 7,690 | 6,190 | 5,140 | 4,340 | 3,750 | 3,260 | 2,870 | 2,560 | 2,270 | 2,050 | 1,850 | 1,680 | 1,540 |       |       |       |
|                                                                                         |                                                                                           |  | 10 - 21 | 13,230 | 13,230 | 8,990  | 6,390  | 4,870 | 3,880 | 3,170 | 2,650 | 2,250 | 1,920 | 1,680 | 1,460 | 1,260 | 1,100 | 970   | 860   | 770   |       |       |       |
| 45°                                                                                     | 136                                                                                       |  | 9 - 84  | 3,970  | 3,970  |        |        |       |       |       |       | 3,660 | 3,170 | 2,780 | 2,450 | 2,180 | 1,980 |       |       |       |       |       |       |
|                                                                                         |                                                                                           |  | 9 - 62  | 3,970  | 3,970  |        |        |       |       | 3,460 | 2,870 | 2,430 | 2,070 | 1,790 | 1,540 | 1,340 | 1,210 |       |       |       |       |       |       |
|                                                                                         | Plus                                                                                      |  | 9 - 62  | 5,840  | 5,840  |        |        |       |       | 5,140 | 4,300 | 3,680 | 3,170 | 2,780 | 2,470 | 2,180 | 1,980 |       |       |       |       |       |       |
|                                                                                         |                                                                                           |  | 9 - 47  | 5,840  | 5,840  |        |        |       | 5,450 | 4,280 | 3,460 | 2,870 | 2,430 | 2,070 | 1,790 | 1,570 | 1,370 | 1,210 |       |       |       |       |       |
|                                                                                         |                                                                                           |                                                                                     |         |        | → lbs  |        |        |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |

→ lbs



19'-6" x 27'-1"

|  α° |  ft → |                                                                                         | ft      | lbs    | ft                                                                                       |        |       |       |       |       |       |       |       |       |       |       |       |       |     |     |     |     |     |     |
|----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|--------|------------------------------------------------------------------------------------------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-----|-----|-----|-----|-----|-----|
|                                                                                        |                                                                                          |                                                                                                                                                                            |         |        | 10                                                                                       | 20     | 29    | 39    | 49    | 59    | 69    | 79    | 89    | 98    | 108   | 118   | 128   | 138   | 148 | 157 | 167 | 177 | 187 | 192 |
| 0°                                                                                     | 192                                                                                      | <br> | 11 - 16 | 17,640 | 17,640                                                                                   | 14,260 | 8,910 | 6,350 | 4,850 | 3,860 | 3,170 | 2,650 | 2,250 | 1,920 | 1,680 | 1,460 | 1,280 | 1,100 | 970 | 860 | 750 | 660 | 570 | 550 |
| 15°                                                                                    | 185                                                                                      | <br> | -       | -      |                                                                                          |        |       |       |       |       |       |       |       |       |       |       |       |       |     |     |     |     |     |     |
|                                                                                        |                                                                                          | <br> | -       | -      |                                                                                          |        |       |       |       |       |       |       |       |       |       |       |       |       |     |     |     |     |     |     |
| 30°                                                                                    | 166                                                                                      | <br> | -       | -      |                                                                                          |        |       |       |       |       |       |       |       |       |       |       |       |       |     |     |     |     |     |     |
|                                                                                        |                                                                                          | <br> | -       | -      |                                                                                          |        |       |       |       |       |       |       |       |       |       |       |       |       |     |     |     |     |     |     |
| 45°                                                                                    | 136                                                                                      | <br> | 9 - 52  | 3,970  | 3,970                                                                                    |        |       |       |       | 3,370 | 2,730 | 2,250 | 1,870 | 1,590 | 1,340 | 1,150 | 990   | 880   |     |     |     |     |     |     |
|                                                                                        |                                                                                          | <br> | 9 - 82  | -      |                                                                                          |        |       |       |       |       |       |       |       |       |       |       |       |       |     |     |     |     |     |     |
|                                                                                        | Plus                                                                                     | <br> | 9 - 39  | 5,840  | 5,840                                                                                    |        |       | 5,780 | 4,320 | 3,370 | 2,730 | 2,250 | 1,900 | 1,590 | 1,370 | 1,170 | 1,010 | 880   |     |     |     |     |     |     |
|                                                                                        |                                                                                          | <br> | -       | -      |                                                                                          |        |       |       |       |       |       |       |       |       |       |       |       |       |     |     |     |     |     |     |
|                                                                                        |                                                                                          |                                                                                                                                                                            |         |        |  lbs |        |       |       |       |       |       |       |       |       |       |       |       |       |     |     |     |     |     |     |

→ lbs

## Trolley mode – with additional ballast (13,230 lbs)

Modo de traslación de carro – con lastre adicional (13.230 lbs)

22,710 lbs



26'-11" x 27'-1"

| <br>α° | <br>ft → |  | ft       | lbs    | ft                                                                                      |    |    |    |        |        |        |        |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------|--------|-----------------------------------------------------------------------------------------|----|----|----|--------|--------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                                                                                         |                                                                                           |                                                                                   |          |        | 10                                                                                      | 20 | 29 | 39 | 49     | 59     | 69     | 79     | 89    | 98    | 108   | 118   | 128   | 138   | 148   | 157   | 167   | 177   | 187   | 192   |       |       |       |       |       |       |
| 0°                                                                                      | 192                                                                                       |  | 11 - 44  | 17,640 | 17,640                                                                                  |    |    |    | 15,670 | 12,960 | 11,000 | 9,520  | 8,380 | 7,450 | 6,700 | 6,080 | 5,560 | 5,090 | 4,700 | 4,340 | 4,030 | 3,770 | 3,530 | 3,420 |       |       |       |       |       |       |
|                                                                                         |                                                                                           |  | 11 - 38  | 17,640 | 17,640                                                                                  |    |    |    | 16,890 | 13,430 | 11,090 | 9,410  | 8,160 | 7,160 | 6,370 | 5,710 | 5,180 | 4,720 | 4,320 | 3,970 | 3,660 | 3,400 | 3,170 | 2,950 | 2,870 |       |       |       |       |       |
|                                                                                         | Plus <sup>2</sup>                                                                         |  | 11 - 47  | 17,640 | 17,640                                                                                  |    |    |    | 16,910 | 13,980 | 11,880 | 10,320 | 9,080 | 8,090 | 7,280 | 6,610 | 6,040 | 5,530 | 5,110 | 4,740 | 4,410 | 4,120 | 3,860 | 3,750 |       |       |       |       |       |       |
| 15°                                                                                     | 185                                                                                       |  | 10 - 164 | 3,970  | 3,970                                                                                   |    |    |    |        |        |        |        |       |       |       |       |       |       |       |       |       |       |       | 3,860 | 3,590 | 3,420 |       |       |       |       |
|                                                                                         |                                                                                           |  | 10 - 138 | 3,970  | 3,970                                                                                   |    |    |    |        |        |        |        |       |       |       |       |       |       |       |       |       |       |       | 3,640 | 3,370 | 3,130 | 2,910 | 2,760 |       |       |
|                                                                                         | Plus                                                                                      |  | 10 - 124 | 5,510  | 5,510                                                                                   |    |    |    |        |        |        |        |       |       |       |       |       |       |       | 5,310 | 4,870 | 4,500 | 4,170 | 3,880 | 3,620 | 3,420 |       |       |       |       |
|                                                                                         |                                                                                           |  | 10 - 84  | 5,510  | 5,510                                                                                   |    |    |    |        |        |        |        |       |       |       |       |       |       |       | 5,160 | 4,540 | 4,060 | 3,640 | 3,280 | 2,980 | 2,730 | 2,490 | 2,290 | 2,120 | 1,980 |
| 30°                                                                                     | 166                                                                                       |  | 10 - 52  | 13,230 | 13,230                                                                                  |    |    |    | 11,640 | 9,830  | 8,470  | 7,430  | 6,590 | 5,910 | 5,340 | 4,850 | 4,430 | 4,080 | 3,770 | 3,530 |       |       |       |       |       |       |       |       |       |       |
|                                                                                         |                                                                                           |  | 10 - 46  | 13,230 | 13,230                                                                                  |    |    |    | 12,240 | 9,940  | 8,360  | 7,160  | 6,240 | 5,510 | 4,920 | 4,410 | 4,010 | 3,640 | 3,330 | 3,060 | 2,870 |       |       |       |       |       |       |       |       |       |
| 45°                                                                                     | 136                                                                                       |  | 9 - 130  | 3,970  | 3,970                                                                                   |    |    |    |        |        |        |        |       |       |       |       |       |       |       |       |       |       |       | 3,750 |       |       |       |       |       |       |
|                                                                                         |                                                                                           |  | 9 - 118  | 3,970  | 3,970                                                                                   |    |    |    |        |        |        |        |       |       |       |       |       |       |       |       |       |       |       | 3,570 | 3,310 |       |       |       |       |       |
|                                                                                         | Plus                                                                                      |  | 9 - 93   | 5,840  | 5,840                                                                                   |    |    |    |        |        |        |        |       |       |       |       |       |       |       | 5,510 | 4,940 | 4,450 | 4,060 | 3,750 |       |       |       |       |       |       |
|                                                                                         |                                                                                           |  | 9 - 86   | 5,840  | 5,840                                                                                   |    |    |    |        |        |        |        |       |       |       |       |       |       |       | 5,620 | 4,960 | 4,410 | 3,970 | 3,590 | 3,310 |       |       |       |       |       |
|                                                                                         |                                                                                           |                                                                                   |          |        |  lbs |    |    |    |        |        |        |        |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |

→ lbs



22'-10" x 27'-1"

| <br>$\alpha^\circ$ | <br>ft → |  | ft       | lbs    | ft     |        |        |        |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|-----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------|--------|--------|--------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                                                                                                     |                                                                                           |                                                                                   |          |        | 10     | 20     | 29     | 39     | 49    | 59    | 69    | 79    | 89    | 98    | 108   | 118   | 128   | 138   | 148   | 157   | 167   | 177   | 187   | 192   |       |       |       |       |       |
| 0°                                                                                                  | 192                                                                                       |  | 11 - 34  | 17,640 | 17,640 |        | 15,190 | 11,860 | 9,680 | 8,130 | 6,970 | 6,080 | 5,380 | 4,810 | 4,320 | 3,920 | 3,570 | 3,260 | 3,000 | 2,780 | 2,580 | 2,380 | 2,310 |       |       |       |       |       |       |
|                                                                                                     |                                                                                           |  | 11 - 28  | 17,640 | 17,640 | 16,230 | 11,820 | 9,190  | 7,470 | 6,260 | 5,360 | 4,650 | 4,080 | 3,640 | 3,240 | 2,930 | 2,650 | 2,400 | 2,200 | 2,030 | 1,850 | 1,720 | 1,650 |       |       |       |       |       |       |
| 15°                                                                                                 | 185                                                                                       |  | 10 - 120 | 3,970  | 3,970  |        |        |        |       |       |       |       |       |       |       |       |       |       |       | 3,640 | 3,310 | 3,020 | 2,760 | 2,540 | 2,340 | 2,200 |       |       |       |
|                                                                                                     |                                                                                           |  | 10 - 93  | 3,970  | 3,970  |        |        |        |       |       |       |       |       |       |       |       |       |       |       | 3,700 | 3,280 | 2,930 | 2,650 | 2,380 | 2,160 | 1,960 | 1,810 | 1,650 | 1,540 |
|                                                                                                     | Plus                                                                                      |  | 10 - 92  | 5,510  | 5,510  |        |        |        |       |       |       |       |       |       |       |       |       |       |       | 5,070 | 4,500 | 4,030 | 3,640 | 3,310 | 3,020 | 2,780 | 2,560 | 2,360 | 2,200 |
|                                                                                                     |                                                                                           |  | 10 - 71  | 5,510  | 5,510  |        |        |        |       |       |       |       |       |       |       |       |       |       |       | 4,920 | 4,250 | 3,730 | 3,310 | 2,950 | 2,650 | 2,400 | 2,180 | 1,980 | 1,810 |
| 30°                                                                                                 | 166                                                                                       |  | 10 - 41  | 13,230 | 13,230 |        |        | 10,740 | 8,710 | 7,280 | 6,220 | 5,400 | 4,760 | 4,230 | 3,790 | 3,440 | 3,110 | 2,840 | 2,600 | 2,430 |       |       |       |       |       |       |       |       |       |
|                                                                                                     |                                                                                           |  | 10 - 31  | 13,230 | 13,230 |        |        | 10,030 | 7,690 | 6,190 | 5,140 | 4,340 | 3,750 | 3,260 | 2,870 | 2,560 | 2,270 | 2,050 | 1,850 | 1,680 | 1,540 |       |       |       |       |       |       |       |       |
| 45°                                                                                                 | 136                                                                                       |  | 9 - 110  | 3,970  | 3,970  |        |        |        |       |       |       |       |       |       |       |       |       |       |       | 3,590 | 3,240 | 2,980 |       |       |       |       |       |       |       |
|                                                                                                     |                                                                                           |  | 9 - 87   | 3,970  | 3,970  |        |        |        |       |       |       |       |       |       |       |       |       |       |       | 3,860 | 3,350 | 2,930 | 2,580 | 2,290 | 2,090 |       |       |       |       |
|                                                                                                     | Plus                                                                                      |  | 9 - 81   | 5,840  | 5,840  |        |        |        |       |       |       |       |       |       |       |       |       |       |       | 5,250 | 4,590 | 4,060 | 3,620 | 3,240 | 2,980 |       |       |       |       |
|                                                                                                     |                                                                                           |  | 9 - 65   | 5,840  | 5,840  |        |        |        |       |       |       |       |       |       |       |       |       |       |       | 5,400 | 4,540 | 3,860 | 3,350 | 2,930 | 2,600 | 2,310 | 2,090 |       |       |
|                                                                                                     |                                                                                           |                                                                                   |          |        | → lbs  |        |        |        |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |

→ lbs



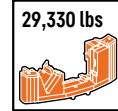
19'-6" x 27'-1"

| <br>$\alpha^\circ$ | <br>ft → |  | ft      | lbs           | ft     |        |        |        |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |
|-------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------|---------------|--------|--------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|
|                                                                                                       |                                                                                             |                                                                                     |         |               | 10     | 20     | 29     | 39     | 49    | 59    | 69    | 79    | 89    | 98    | 108   | 118   | 128   | 138   | 148   | 157   | 167   | 177   | 187   | 192   |  |
| 0°                                                                                                    | 192                                                                                         |  | 11 - 23 | <b>26,247</b> | 26,247 | 20,046 | 14,436 | 11,188 | 9,022 | 7,513 | 6,365 | 5,512 | 4,823 | 4,232 | 3,773 | 3,379 | 3,018 | 2,723 | 2,493 | 2,264 | 2,067 | 1,870 | 1,804 |       |  |
|                                                                                                       |                                                                                             |  | 11 - 16 | <b>17,640</b> | 17,640 | 13,980 | 9,060  | 6,590  | 5,110 | 4,100 | 3,400 | 2,870 | 2,450 | 2,120 | 1,850 | 1,610 | 1,430 | 1,260 | 1,120 | 990   | 880   | 770   | 680   | 660   |  |
| 15°                                                                                                   | 185                                                                                         |  | 10 - 77 | <b>3,970</b>  | 3,970  |        |        |        |       |       |       | 3,860 | 3,310 | 2,890 | 2,540 | 2,250 | 2,010 | 1,790 | 1,610 | 1,460 | 1,300 | 1,190 | 1,100 |       |  |
|                                                                                                       |                                                                                             |  | -       | -             |        |        |        |        |       |       |       | -     |       |       |       |       |       |       |       |       |       |       |       |       |  |
|                                                                                                       | Plus                                                                                        |  | 10 - 59 | <b>5,510</b>  | 5,510  |        |        |        |       |       |       | 4,560 | 3,860 | 3,330 | 2,890 | 2,560 | 2,250 | 2,010 | 1,810 | 1,610 | 1,460 | 1,320 | 1,190 | 1,100 |  |
| 30°                                                                                                   | 166                                                                                         |  | 10 - 27 | <b>13,230</b> | 13,230 | 11,990 | 8,660  | 6,700  | 5,400 | 4,500 | 3,810 | 3,280 | 2,870 | 2,510 | 2,230 | 1,980 | 1,760 | 1,590 | 1,430 | 1,320 |       |       |       |       |  |
|                                                                                                       |                                                                                             |  | -       | -             | -      |        |        |        |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |
| 45°                                                                                                   | 136                                                                                         |  | 9 - 77  | <b>3,970</b>  | 3,970  |        |        |        |       |       |       | 3,860 | 3,280 | 2,840 | 2,490 | 2,180 | 1,940 | 1,760 |       |       |       |       |       |       |  |
|                                                                                                       |                                                                                             |  | 9 - 52  | <b>3,970</b>  | 3,970  |        |        |        |       |       |       | 3,370 | 2,730 | 2,250 | 1,870 | 1,590 | 1,340 | 1,150 | 990   | 880   |       |       |       |       |  |
|                                                                                                       | Plus                                                                                        |  | 9 - 57  | <b>5,840</b>  | 5,840  |        |        |        |       |       |       | 5,640 | 4,610 | 3,860 | 3,310 | 2,870 | 2,490 | 2,200 | 1,940 | 1,760 |       |       |       |       |  |
|                                                                                                       |                                                                                             |  | 9 - 39  | <b>5,840</b>  | 5,840  |        |        |        |       |       |       | 4,320 | 3,370 | 2,730 | 2,250 | 1,900 | 1,590 | 1,370 | 1,170 | 1,010 | 880   |       |       |       |  |
|                                                                                                       |                                                                                             |                                                                                     |         |               | → lbs  |        |        |        |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |

→ lbs

# Trolley mode – with additional ballast (19,850 lbs)

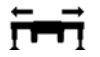
Modo de traslación de carro – con lastre adicional (19.850 lbs)



26'-11" x 27'-1"

| <br>$\alpha^\circ$ | <br>ft → |  | ft                                                                                | lbs     | ft     |    |    |    |        |        |    |    |        |        |     |     |        |        |        |        |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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|                                                                                                     |                                                                                           |                                                                                   |                                                                                   |         | 10     | 20 | 29 | 39 | 49     | 59     | 69 | 79 | 89     | 98     | 108 | 118 | 128    | 138    | 148    | 157    | 167   | 177   | 187   | 192   |       |       |       |       |       |       |       |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0°                                                                                                  | 192                                                                                       |  | 11 - 44                                                                           | 17,640  |        |    |    |    | 17,640 |        |    |    | 16,070 |        |     |     | 13,710 | 11,900 | 10,470 | 9,330  | 8,360 | 7,540 | 6,860 | 6,240 | 5,730 | 5,270 | 4,850 | 4,500 | 4,170 | 3,880 | 3,750 |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                                                                                                     |                                                                                           |  | 11 - 39                                                                           | 17,640  |        |    |    |    | 17,640 |        |    |    | 14,620 |        |     |     | 12,410 | 10,740 | 9,410  | 8,330  | 7,450 | 6,720 | 6,080 | 5,560 | 5,090 | 4,670 | 4,300 | 3,970 | 3,680 | 3,420 | 3,310 |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                                                                                                     |                                                                                           | Plus <sup>2</sup>                                                                 |  | 11 - 47 | 17,640 |    |    |    |        | 17,640 |    |    |        | 16,990 |     |     |        | 14,340 | 12,370 | 10,860 | 9,650 | 8,670 | 7,860 | 7,170 | 6,590 | 6,080 | 5,640 | 5,250 | 4,900 | 4,590 | 4,320 | 4,190 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 15°                                                                                                 | 185                                                                                       |  | 10 - 177                                                                          | 3,970   | 3,970  |    |    |    |        |        |    |    |        |        |     |     |        |        |        |        |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

→ lbs



22'-10" x 27'-1"

|  |      |                                                                                   | ft       | lbs    | ft     |    |    |    |        |        |        |        |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |
|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|----------|--------|--------|----|----|----|--------|--------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|
| $\alpha^\circ$                                                                    | ft → |  |          |        | 10     | 20 | 29 | 39 | 49     | 59     | 69     | 79     | 89    | 98    | 108   | 118   | 128   | 138   | 148   | 157   | 167   | 177   | 187   | 192   |       |       |       |  |
| 0°                                                                                | 192  |  | 11 - 42  | 17,640 | 17,640 |    |    |    |        | 14,660 | 11,970 | 10,080 | 8,660 | 7,580 | 6,720 | 6,020 | 5,420 | 4,940 | 4,500 | 4,140 | 3,810 | 3,550 | 3,280 | 3,060 | 2,980 |       |       |  |
|                                                                                   |      |  | 11 - 34  | 17,640 | 17,640 |    |    |    | 15,280 | 11,990 | 9,830  | 8,290  | 7,120 | 6,240 | 5,530 | 4,940 | 4,450 | 4,060 | 3,700 | 3,400 | 3,130 | 2,890 | 2,690 | 2,490 | 2,430 |       |       |  |
| 15°                                                                               | 185  |  | 10 - 144 | 3,970  | 3,970  |    |    |    |        |        |        |        |       |       |       |       |       |       |       |       | 3,840 |       |       | 3,550 | 3,260 | 3,040 | 2,870 |  |
|                                                                                   |      |  | 10 - 120 | 3,970  | 3,970  |    |    |    |        |        |        |        |       |       |       |       |       |       |       | 3,640 | 3,310 | 3,020 | 2,760 | 2,540 | 2,340 | 2,200 |       |  |
|                                                                                   | Plus |  | 10 - 111 | 5,510  | 5,510  |    |    |    |        |        |        |        |       |       |       |       |       |       | 5,090 | 4,610 | 4,210 | 3,860 | 3,550 | 3,280 | 3,040 | 2,870 |       |  |
|                                                                                   |      |  | 10 - 92  | 5,510  | 5,510  |    |    |    |        |        |        |        |       |       |       |       |       | 5,070 | 4,500 | 4,030 | 3,640 | 3,310 | 3,020 | 2,780 | 2,560 | 2,360 | 2,200 |  |
| 30°                                                                               | 166  |  | 10 - 49  | 13,230 | 13,230 |    |    |    |        | 10,710 | 8,970  | 7,690  | 6,700 | 5,910 | 5,270 | 4,740 | 4,300 | 3,920 | 3,590 | 3,310 | 3,090 |       |       |       |       |       |       |  |
|                                                                                   |      |  | 10 - 39  | 13,230 | 13,230 |    |    |    | 10,270 | 8,330  | 6,970  | 5,950  | 5,180 | 4,560 | 4,060 | 3,640 | 3,280 | 2,980 | 2,710 | 2,490 | 2,310 |       |       |       |       |       |       |  |
| 45°                                                                               | 136  |  | 9 - 130  | 3,970  | 3,970  |    |    |    |        |        |        |        |       |       |       |       |       |       |       |       | 3,750 |       |       |       |       |       |       |  |
|                                                                                   |      |  | 9 - 110  | 3,970  | 3,970  |    |    |    |        |        |        |        |       |       |       |       |       |       |       | 3,590 | 3,240 | 2,980 |       |       |       |       |       |  |
|                                                                                   | Plus |  | 9 - 93   | 5,840  | 5,840  |    |    |    |        |        |        |        |       |       |       |       |       | 5,510 | 4,940 | 4,450 | 4,060 | 3,750 |       |       |       |       |       |  |
|                                                                                   |      |  | 9 - 81   | 5,840  | 5,840  |    |    |    |        |        |        |        |       |       |       |       | 5,250 | 4,590 | 4,060 | 3,620 | 3,240 | 2,980 |       |       |       |       |       |  |
|                                                                                   |      |                                                                                   |          |        | lb →   |    |    |    |        |        |        |        |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |

→ lbs



19'-6" x 27'-1"

|  |  |                                                                                     | ft       | lbs    | ft     |    |        |    |        |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----------|--------|--------|----|--------|----|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| $\alpha^\circ$                                                                      | ft →                                                                                |                                                                                     |          |        | 10     | 20 | 29     | 39 | 49     | 59    | 69    | 79    | 89    | 98    | 108   | 118   | 128   | 138   | 148   | 157   | 167   | 177   | 187   | 192   |       |       |       |       |
| 0°                                                                                  | 192                                                                                 |  | 11 - 30  | 17,640 | 17,640 |    | 12,990 |    | 10,120 | 8,220 | 6,900 | 5,910 | 5,140 | 4,520 | 4,030 | 3,620 | 3,260 | 2,950 | 2,690 | 2,470 | 2,270 | 2,090 | 1,940 | 1,870 |       |       |       |       |
|                                                                                     |                                                                                     |  | 11 - 22  | 17,640 | 17,640 |    | 13,140 |    | 9,680  | 7,580 | 6,170 | 5,180 | 4,430 | 3,840 | 3,370 | 3,000 | 2,670 | 2,400 | 2,160 | 1,960 | 1,790 | 1,630 | 1,500 | 1,370 | 1,320 |       |       |       |
| 15°                                                                                 | 185                                                                                 |  | 10 - 102 | 3,970  | 3,970  |    |        |    |        |       |       |       |       |       | 3,660 |       | 3,280 | 2,950 | 2,670 | 2,450 | 2,230 | 2,050 | 1,870 | 1,760 |       |       |       |       |
|                                                                                     |                                                                                     |  | 10 - 77  | 3,970  | 3,970  |    |        |    |        |       |       |       |       |       | 3,860 |       | 3,310 | 2,890 | 2,540 | 2,250 | 2,010 | 1,790 | 1,610 | 1,460 | 1,300 | 1,190 | 1,100 |       |
|                                                                                     | Plus                                                                                |  | 10 - 77  | 5,510  | 5,510  |    |        |    |        |       |       |       |       |       | 5,400 |       | 4,700 | 4,120 | 3,680 | 3,280 | 2,950 | 2,690 | 2,450 | 2,230 | 2,050 | 1,900 | 1,760 |       |
|                                                                                     |                                                                                     |  | 10 - 59  | 5,510  | 5,510  |    |        |    |        |       |       |       |       |       | 4,560 |       | 3,860 | 3,330 | 2,890 | 2,560 | 2,250 | 2,010 | 1,810 | 1,610 | 1,460 | 1,320 | 1,190 | 1,100 |
| 30°                                                                                 | 166                                                                                 |  | 10 - 34  | 13,230 | 13,230 |    | 11,420 |    | 8,910  | 7,250 | 6,080 | 5,200 | 4,520 | 3,970 | 3,530 | 3,150 | 2,840 | 2,580 | 2,340 | 2,140 | 1,980 |       |       |       |       |       |       |       |
|                                                                                     |                                                                                     |  | 10 - 26  | 13,230 | 13,230 |    | 11,200 |    | 8,110  | 6,280 | 5,070 | 4,210 | 3,550 | 3,060 | 2,670 | 2,340 | 2,070 | 1,830 | 1,630 | 1,480 | 1,320 | 1,210 |       |       |       |       |       |       |
| 45°                                                                                 | 136                                                                                 |  | 9 - 100  | 3,970  | 3,970  |    |        |    |        |       |       |       |       |       | 3,570 |       | 3,200 | 2,870 | 2,650 |       |       |       |       |       |       |       |       |       |
|                                                                                     |                                                                                     |  | 9 - 77   | 3,970  | 3,970  |    |        |    |        |       |       |       |       |       | 3,860 |       | 3,280 | 2,840 | 2,490 | 2,180 | 1,940 | 1,760 |       |       |       |       |       |       |
|                                                                                     | Plus                                                                                |  | 9 - 73   | 5,840  | 5,840  |    |        |    |        |       |       |       |       |       | 5,310 |       | 4,610 | 4,060 | 3,590 | 3,220 | 2,890 | 2,650 |       |       |       |       |       |       |
|                                                                                     |                                                                                     |  | 9 - 57   | 5,840  | 5,840  |    |        |    |        |       |       |       |       |       | 5,640 |       | 4,610 | 3,860 | 3,310 | 2,870 | 2,490 | 2,200 | 1,940 | 1,760 |       |       |       |       |

→ lbs

**All the load capacities are given for max. erection height, higher load capacities are achieved for lower erection heights. Furthermore, the data apply to wind forces up to max. 46 ft/s (6.5 Bft). Lower load capacities are achieved for stronger winds. For detailed information please refer to the instruction manual.**

Todas las capacidades de carga se dan para la máxima altura de construcción, se pueden lograr mayores capacidades de carga con alturas de construcción más bajas.

Además, los datos son aplicables a velocidades de viento de hasta 46 ft/s (6,5 Bft = Escala de Beaufort). Si los vientos son más fuertes, se alcanzan capacidades de carga menores.

Información más detallada al respecto, en el Manual de Instrucciones.

## Crane operation

|                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Slewing platform</b>           | Steel-plate structure including tower pivot bearing and connection to slewing ring. Connected to the crane chassis by a Liebherr slewing ring with internal toothing. Slewing platform interlocking to undercarriage.                                                                                                                                                                                                                                                                                       |
| <b>Jib</b>                        | Four-section jib, very high overhead assembly curve so that only little space is needed for erecting. Erection takes place with a separate winch and by engaging the jib assembly winch. The jib is guyed by telescopic rods or cables. Hydraulic jib slewing device.                                                                                                                                                                                                                                       |
| <b>Jib position</b>               | 0°, 15°, 30°, 45° standard jib positions achieved by shortening the rear jib guying, possible when the crane is in operating condition, via remote control or from the elevating cabin.                                                                                                                                                                                                                                                                                                                     |
| <b>Luffing mode</b>               | Additional mode for continuously adjusting the jib from -20° to 70° whilst loaded. The hoist rope is taken around the jib head in a single line for this purpose.                                                                                                                                                                                                                                                                                                                                           |
| <b>Outriggers</b>                 | 4-point support, all-hydraulic horizontal and vertical operation, automatic outrigger levelling, electronic inclination display; operation using BTT module (Bluetooth remote control).                                                                                                                                                                                                                                                                                                                     |
| <b>Tower</b>                      | Three-section telescopic tower of solid construction with tower lock to slewing platform.                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Power supply</b>               | 60.0 kVA diesel-powered generator, tank on superstructure (45 US gal); alternatively power supply from site cabinet (external connection 63 A/380 – 480 V). Exhaust emissions acc. to directive EPA/CARB.                                                                                                                                                                                                                                                                                                   |
| <b>Electrical system</b>          | 24 V DC, 2 x 170 Ah batteries; 4 rotating beacons (yellow); support lights; 1 socket on the rear of the vehicle (15-pole – 24 V); battery charger for charging the chassis battery during generator and mains operation; acoustic reversing warning; lights compliant with Road Traffic Act; external power connection for crane supply; programmable logic controller (PLC); configuration monitoring; working range limiting system; battery charger for charging the superstructure battery; anemometer. |
| <b>Slewing gear</b>               | Continuously variable operating speeds, electronic wind load control and automatic load oscillation damping. Counter-current can be applied in absolute safety with individually adjustable speed and torque control, 7.5 kW frequency converter, 0 – 0.8 rpm.                                                                                                                                                                                                                                              |
| <b>Trolley travel gear</b>        | Trolley travel gear with frequency converter and continuously variable speeds, 6.0 kW FC 0 – 262 ft/min.                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Hoist gear</b>                 | Hoist gear drive with two drums, one for erection and one for hoisting. Frequency-converter control provides continuously variable hoisting and lowering speeds, with Micromove precision positioning mode; 24 kW FC SD.shift – max. 328 ft/min.                                                                                                                                                                                                                                                            |
| <b>Elevating cabin</b>            | Elevating operator's cab with all-round visibility, continuously height-adjustable with separate drive unit and safety glass all round; crane operator's seat with seat heating and seat contact switch with integral master switches; Bluetooth radio; air-conditioning system; external intercom system with microphone; rescue device for emergency exit; emergency lowering system; electronic monitor system (EMS) with angle monitor and support pressure indicator.                                  |
| <b>Flight warning</b>             | Flight warning light can be switched to flashing or permanent light.                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Site Lights</b>                | 6 x 154 W LED placed on the tower and in the jib.                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Remote control</b>             | Remote control for full control with response, color display; including „Start/Stop generator“ function, including charger.                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Movement in operating mode</b> | Slow movement of the crane in erected condition is possible due to its good centre of gravity. The supports must remain horizontally extended for this purpose.                                                                                                                                                                                                                                                                                                                                             |

## Transport

|                     |                                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Vehicle</b>      | Liebherr designed and manufactured, box type, torsion resistant design of high-tensile fine grained structural steel.                                                                                                                                                                                                                                                                                              |
| <b>Engine</b>       | 6-cylinder diesel engine, manufactured by Liebherr, type D946 A7 SCR, water-cooled, 400 kW at 1,900 rpm, max. torque 2,494 Nm at 1,200 rpm. Exhaust emissions comply with EU 2016/1628 – Stage V. Fuel tank capacity: 124 US gal.                                                                                                                                                                                  |
| <b>Transmission</b> | ZF 12-speed gear box with automatic AS-TRONIC control system. 12 forwards and 2 reverse gears; intarder; two-stage transfer case with lockable longitudinal differential.                                                                                                                                                                                                                                          |
| <b>Speeds</b>       | Forwards travel up to max. 50 mph, reverse up to max. 5 mph; gradients < 62.6%.                                                                                                                                                                                                                                                                                                                                    |
| <b>Brakes</b>       | Service brake: all-wheel servo-air brake, all axles are equipped with disc brakes, dual circuit. Handbrake: spring-loaded, acting on wheels of axles 2, 3, 4 and 5. Sustained-action brake: exhaust retarder with additional Liebherr braking system. Brakes comply with EC Directives ECE R13 or ECE R79;                                                                                                         |
| <b>Steering</b>     | ZF-Servocom hydraulic steering, dual-circuit system with hydraulic servo device and additional reserve pump powered by the axle. Active rear axle steering with 5 electronic drive programs. 1 <sup>st</sup> and 2 <sup>nd</sup> axles mechanically, 3 <sup>rd</sup> , 4 <sup>th</sup> and 5 <sup>th</sup> axles electro-hydraulically steered dependent on speed. Steering complies with EC Directive 70/311/EEC. |
| <b>Axles</b>        | All axles steered. Axles 2, 4 and 5 driven, with differential locks.                                                                                                                                                                                                                                                                                                                                               |
| <b>Suspension</b>   | All axles with hydropneumatic suspension, automatic levelling and hydraulic locking facility; suspension travel -0°-4" / +0°-4".                                                                                                                                                                                                                                                                                   |
| <b>Tyres</b>        | 10 tyres. Tyre size: 385/95 R25.                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Driver's cab</b> | Spacious steel, corrosion-resistant cab, cataphoretic dip-primed, on resilient suspension with hydraulic shock absorbers, sound and heat absorbing internal panelling compliant with EC Directive, safety glazing, operating and control instruments, comfortably equipped with unobstructed view of the road.                                                                                                     |
| <b>Legal note</b>   | Refer to national regulations for maximum axle loads.                                                                                                                                                                                                                                                                                                                                                              |

## Additional equipment

|                                        |                                                                                                                                                                                                                                                                                  |
|----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Plus package (**)</b>               | Load capacity increase with additional load curves; reduced working speeds in Plus mode; control system limitations compared to standard load curve; function with horizontal jib and wide outrigger position possible with and without additional ballast.                      |
| <b>Lattice jib heads</b>               | Extensions for luffing mode to 205 ft and 213 ft; No. 1 can remain on the crane in its transport position, trolley mode and during erection                                                                                                                                      |
| <b>Engine stop with emergency stop</b> | Emergency stop switch and excess engine speed protection for undercarriage engine and diesel generator.                                                                                                                                                                          |
| <b>Additional ballast</b>              | to increase load capacity; for self-ballasting device; 4-piece; weight 19,850 lbs.                                                                                                                                                                                               |
| <b>Self-ballasting device</b>          | The crane can position additional ballast itself without requiring an additional crane on another vehicle.                                                                                                                                                                       |
| <b>Equipment holder</b>                | Support area 59.2 ft² with additional storage space, centre can be pulled up on site, can be raised and lowered hydraulically, including road lights compliant with Road Traffic Act; meets the underrun protection requirements according to ECE R58.                           |
| <b>Combination box</b>                 | Locking box for various accessories, alternative to equipment holder; including road lights compliant with Road Traffic Act.                                                                                                                                                     |
| <b>Hook camera</b>                     | Camera system can be connected to the trolley or jib head (in luffing mode) with wireless transmission and 7" colour display; camera with motorised zoom and autofocus; including battery pack and automatic charge function in transport mode and trolley in internal position. |
| <b>Reversing camera</b>                | With 7" colour display, signal transferred to cab by current collector.                                                                                                                                                                                                          |
| <b>Hand-held light</b>                 | Mobile halogen hand-held unit, 50 W, battery-powered, external battery                                                                                                                                                                                                           |
| <b>Trailer coupling</b>                | Variable trailer coupling system with either manoeuvring coupling, heavy duty coupling (D19) or car ball coupling.                                                                                                                                                               |
| <b>Rear area lighting</b>              | LED floodlight for additional lighting of surroundings.                                                                                                                                                                                                                          |
| <b>Further options on request.</b>     |                                                                                                                                                                                                                                                                                  |

## Important technical information

**No dismantling required when shut down, free jib slewing of crane possible depending on configuration.**

**Load capacity figures net, hook block can be ignored.**

**No re-reeving required for max. load capacity.**

**The hook heights are calculated, idealised values which do not take into consideration any deformation.**

# Funcionamiento de la grúa

|                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Plataforma giratoria</b>                 | Plataforma giratoria en estructura de chapa de acero, ejecutada con asiento de cojinetes para la torre y unión con la corona giratoria de bolas. Como elemento de unión con el carro de la grúa se emplea una corona giratoria de bolas Liebherr con dentado interior; bloqueo de plataforma giratoria con el chasis de rodadura.                                                                                                                                                                                                                                                                                         |
| <b>Pluma</b>                                | Pluma de cuatro tramos, con alto recorrido de curva de montaje de pluma suspendida, con lo que se requiere un escaso espacio para su montaje. El montaje con pluma suspendida se realiza a través de un cabrestante separado y la conexión adicional de un cabrestante de montaje de la propia pluma. El arriostamiento de la pluma se efectúa por medio de tirantes telescópicos o bien mediante cables de arriostamiento. Dispositivo hidráulico de giro de la pluma.                                                                                                                                                   |
| <b>Inclinación de pluma</b>                 | Posiciones de serie de la pluma de 0°, 15°, 30°, 45° mediante el acortamiento del arriostamiento posterior, con opción desde el estado de funcionamiento mediante radiocontrol remoto o desde la cabina de elevación.                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Modo basculante</b>                      | Funcionamiento adicional para el ajuste continuo de la pluma de -20° a 70° bajo carga. El cable de elevación pasa en un solo hilo por la punta de la pluma.                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Estabilizadores</b>                      | Estabilización mediante 4 puntos de apoyo, con extracción horizontal y vertical totalmente hidráulica. Manejo mediante control remoto, nivelación de estabilizadores automática, indicador electrónico de in-clinación; manejo por medio de módulo BTT (manejo remoto por Bluetooth).                                                                                                                                                                                                                                                                                                                                     |
| <b>Torre</b>                                | Torre telescópica de tres piezas de sólida construcción en alma llena con bloqueo de la torre respecto a la plataforma giratoria.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Suministro de corriente</b>              | Grupo generador diésel de 60,0 kVA. Depósito propio de equipo giratorio (45 US gal), alimentación de corriente alternativa a través de la fuente de corriente de la obra (conexión de corriente de fuente externa de 63 A/ 380 – 480 V). Emisiones de escape de acuerdo con la regulación y EPA/CARB.                                                                                                                                                                                                                                                                                                                     |
| <b>Sistema eléctrico</b>                    | Corriente continua 24 V, 2 baterías de 170 Ah cada una; 4 luces de señalización giratorias (amarillo); iluminación de apoyos; 1 enchufe en la parte trasera del vehículo (15 pines – 24 V); cargador de batería para cargar la batería del chasis con funcionamiento de red y agregado; advertencia acústica de marcha atrás; alumbrado según Ley de tráfico; conexión de corriente ajena para el suministro de la grúa; sistema de control de memoria programable (PLC); monitorización de configuraciones; sistema de limitación del rango de trabajo, cargador de batería para cargar la superestructura; anenómetros. |
| <b>Mecanismo de giro</b>                    | Velocidades de trabajo regulables sin escalonamientos, control electrónico del impacto del viento sobre la carga y amortiguador automático de la oscilación de carga. Mecanismo con opción de bloqueo por contratuerca y asegurado por contratuerca, con control individual del par de giro y la velocidad de giro, CF 7,5 kW, 0 – 0,8 rpm.                                                                                                                                                                                                                                                                               |
| <b>Cabrestante para traslación de carro</b> | Accionamiento de cabrestante para traslación de carro con convertidor de frecuencia y velocidades regulables de forma continua, CF 6,0 kW 0 – 262 ft/min.                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

|                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Mecanismo de elevación</b>                        | Accionamiento de mecanismo de elevación con dos tambores para montaje y funcionamiento de elevación. El accionamiento con control por convertidor de frecuencia ofrece una velocidad de subida y bajada continua, con modo de posicionamiento de precisión Micromove; CF 24 kW SD.shift – máx. 328 ft/min.                                                                                                                                                                                                                                                                         |
| <b>Cabina de elevación</b>                           | Cabina panorámica ejecutada como cabina de elevación, con regulación continua de la altura con su propio accionamiento y acristalamiento panorámico de seguridad; butaca para el conductor de la grúa con calefacción e interruptor de contacto de asiento, con interruptores maestros integrados; radio Bluetooth con reproductor de CD; sistema de climatización; intercomunicador exterior con micrófono; sistema de rescate para salida de emergencia; descargado; sistema de monitor electrónico (EMS) con control de inclinación e indicador de carga sobre estabilizadores. |
| <b>Advertencia para tráfico aéreo</b>                | Luz de advertencia para aeronaves conmutable a luz intermitente o a luz continua.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Iluminación de la obra</b>                        | 6 faros LED de 154 W dispuestos en la pluma.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Manejo por control remoto</b>                     | Manejo por control remoto para el funcionamiento completo con acuse de recibo, pantalla a color; incluye función „Arranque/inicio de generador“, cargador incluido.                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Desplazamiento en el estado de funcionamiento</b> | El lento desplazamiento de la grúa en el estado izado es posible gracias a la posición favorable del centro de gravedad. Los estabilizadores deben permanecer en este caso extendidos en horizontal.                                                                                                                                                                                                                                                                                                                                                                               |

## Transporte

|                          |                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Vehículo</b>          | Estructura tipo caja a prueba de torsión de fabricación propia, a base de acero estructural de grano fino y alta resistencia.                                                                                                                                                                                                                                                                                 |
| <b>Motor</b>             | Diésel de 6 cilindros, marca Liebherr, tipo D946 A7 SCR, refrigerado por agua, potencia de 400 kW a 1.900 rpm, par de giro máx. 2.494 Nm a 1.200 rpm. Emisiones de gas conforme a la directiva EU 2016/1628 – Etapa V. Depósito de combustible: 124 US gal.                                                                                                                                                   |
| <b>Transmisión</b>       | Caja de cambios de 12 marchas ZF con cambio automático AS-TRONIC. 12 marchas adelante y 2 atrás; Intarder; caja de transmisión de dos etapas con diferencial longitudinal bloqueable.                                                                                                                                                                                                                         |
| <b>Velocidades</b>       | Marcha hacia delante a un máx. de 50 mph; marcha atrás a un máx. de 5 mph; pendientes < 62,6%.                                                                                                                                                                                                                                                                                                                |
| <b>Frenos</b>            | Freno de servicio: servofreno neumático con actuación a todas las ruedas, todos los ejes están equipados con frenos de discos, sistema de dos circuitos hidráulicos. Freno de mano: por acumuladores de muelle con actuación a las ruedas de los ejes 2, 3, 4 y 5. Freno continuo: freno de chapaleta de escape con sistema de freno adicional Liebherr. Frenos según directivas de la CEE ECE R13 o ECE R79; |
| <b>Dirección</b>         | Dirección hidráulica ZF Servocom, sistema de dos circuitos con dirección asistida hidráulica y una bomba de reserva adicional, activada a través del eje. Dirección activa de eje posterior con 5 programas electrónicos de marcha. 1° y 2° eje articulable mecánicamente, y 3°, 4° y 5° eje articulable electrohidráulicamente, en función de la velocidad. Dirección según directivas de la CEE 70/311 CEE. |
| <b>Ejes</b>              | Todos los ejes son direccionables. Los ejes 2, 4 y 5 son accionados con bloqueos diferenciales.                                                                                                                                                                                                                                                                                                               |
| <b>Suspensión</b>        | Todos los ejes con suspensión hidroneumática, con regulación automática de nivel. Suspensión con bloqueo hidráulico; Recorrido de suspensión -0'-4" / +0'-4".                                                                                                                                                                                                                                                 |
| <b>Neumáticos</b>        | 10 neumáticos de tamaño 385/95 R25.                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Cabina</b>            | Cabina espaciosa fabricada en chapa de acero, resistente a la corrosión mediante imprimación cateforética por inmersión, con suspensión elástica y amortiguación hidráulica, revestimiento interior de aislante térmico y acústico según directivas de la CEE, acristalamiento de seguridad, instrumentos de mando y control, equipamiento de gran comodidad, con plena vista a la carretera.                 |
| <b>Advertencia legal</b> | Observar las regulaciones prescripciones nacionales en materia de carga máx. por eje.                                                                                                                                                                                                                                                                                                                         |

## Equipamiento adicional

|                                                       |                                                                                                                                                                                                                                                                                                                                                       |
|-------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Paquete Plus (**)</b>                              | Aumento de la capacidad de carga con curva de carga adicional; velocidades de trabajo reducidas de forma condicionada en el funcionamiento Plus; condicionadas las restricciones técnicas a la con la curva de carga estándar; funcionamiento con la pluma en horizontal y apoyo ancho con y sin lastre adicional.                                    |
| <b>Puntas en celosía</b>                              | Ampliaciones para el modo basculante a 205 ft y 213 ft; el n.º 1 puede permanecer también en la grúa en posición de transporte; en modo Katz y durante el montaje.                                                                                                                                                                                    |
| <b>Parada del motor con desconexión de emergencia</b> | Botón de parada Interruptor de desconexión de emergencia y protección frente a velocidad de rotación excesiva para motor del chasis de rodadura y el grupo generador diésel.                                                                                                                                                                          |
| <b>Lastre adicional</b>                               | Para aumentar la capacidad de carga; modelo para dispositivo de autolastrado; 4 piezas; peso de 19.850 lbs.                                                                                                                                                                                                                                           |
| <b>Dispositivo de autolastrado</b>                    | La grúa puede emplazarse por sí misma con lastre adicional sin necesidad de una máquina externa ajena                                                                                                                                                                                                                                                 |
| <b>Bastidor portante</b>                              | Superficie de depósito de 59,2 ft²; con espacio de almacenamiento adicional; abatible hacia arriba en el centro en el lugar de la obra, con capacidad de elevación y bajada hidráulicamente; incluye alumbrado para marcha por carretera conforme a ley alemana StVZO; protección antiempeño conforme a los requisitos ECE R58.                       |
| <b>Caja combinada</b>                                 | Caja cerrable con llave para distintos accesorios de tracción; alternativamente para bastidor portante; incluye alumbrado para marcha por carretera conforme a ley alemana StVZO.                                                                                                                                                                     |
| <b>Sistema de cámara</b>                              | Sistema de cámara enchufable al carrito o a la punta de la pluma (en el modo basculante) con radiotransmisión y pantalla a color de 7"; cámara con zoom motorizado y enfoque automático; incluye paquete de baterías acumuladores y función de carga automática en el estado de transporte y en la posición interior del carro de grúa interiormente. |
| <b>Cámara de marcha atrás</b>                         | Con pantalla a color de 7"; transmisión de señales a la cabina a través del colector.                                                                                                                                                                                                                                                                 |
| <b>Faros móviles</b>                                  | Unidad manual móvil de faros halógenos, 50 W, funcionamiento con baterías acumuladores; batería externa acumuladores externos.                                                                                                                                                                                                                        |
| <b>Enganche de remolque</b>                           | Sistema de enganche de remolque con derivación opcional, pesado (D19) o acoplamiento auto-ball.                                                                                                                                                                                                                                                       |
| <b>Iluminación trasera</b>                            | Faros LED para iluminación del entorno adicional.                                                                                                                                                                                                                                                                                                     |
| <b>Otras opciones bajo petición</b>                   |                                                                                                                                                                                                                                                                                                                                                       |

## Información técnica importante

Estando fuera de servicio no es necesario el desmontaje; la grúa puede activar la puesta en veleta dependiendo de la configuración.

Indicaciones de carga neta; no es preciso tomar en consideración la garrucha de gancho.

No es necesario un cambio de ramales para la carga máxima.

Las alturas bajo gancho son valores calculados ideales que no toman en consideración la deformación del material bajo carga.

**This information is supplied without liability.**

Declinamos toda responsabilidad derivada de la información proporcionada.

**Subject to technical modifications!**

¡Sujeto a modificaciones sin previo aviso!

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