

INFORMATION BULLETIN OPERATING ON SIDE SLOPES

Mobile Cranes are primarily designed to be used on firm, flat, level ground to within 0.57° (1% gradient), according to AS 1418.5, any deviation from this requires that the Rated Capacity shall be reduced accordingly. As per AS 2550.5 – negotiation of slopes by mobile cranes travelling with suspended loads should be avoided.

The following precautions shall be taken when operating on **out of level side slopes, over 0.57° (1% gradient) and up to 5° (8.75% gradient)** – **REMEMBER** surface depressions and potholes will create the same effect as a side slope. We have no published data for operating on side slopes over 5° (8.75% gradient) – this would have to be assessed as a designed lift in accordance with AS 2550.1.

- Ensure the tyres are correctly **INFLATED** as per load chart.
- Ensure the ground condition is **FIRM** enough to support the axle loads.
- **REDUCE** the rated capacity of the crane by the percentage value for the applicable crane model as shown in figure 1,2 or 3 for operating on side slopes up to 5° (8.75% gradient) - **REMEMBER** the crane's load indicator will **NOT** automatically derate the rated capacity.
- Use the crane's side slope inclinometer as a guide only, it is most accurate when the crane's articulation is straight ahead without suspending a load. All articulated chassis cranes will show some degree of side tilt, when articulated with a load – this should not be confused with the ground's side slope.
- Use the **MINIMUM** boom length and boom angle practical to keep the boom tip as close to the ground as possible.
- Keep the load as **CLOSE** to the ground as possible.
- Use the **MINIMUM** articulation angle practical - **REMEMBER** the crane will side tilt and hence the hook will move towards the direction of articulation whilst steering.
- Keep the load on the **UPHILL** side of the crane where possible, especially when articulated – **REMEMBER** the working radius will increase if the load is suspended in the downhill position.
- Load swing greatly reduces stability – **REMEMBER** to tagline loads to prevent pendulum motion of the load. Travel and crane motions should be applied gently to minimise this effect.

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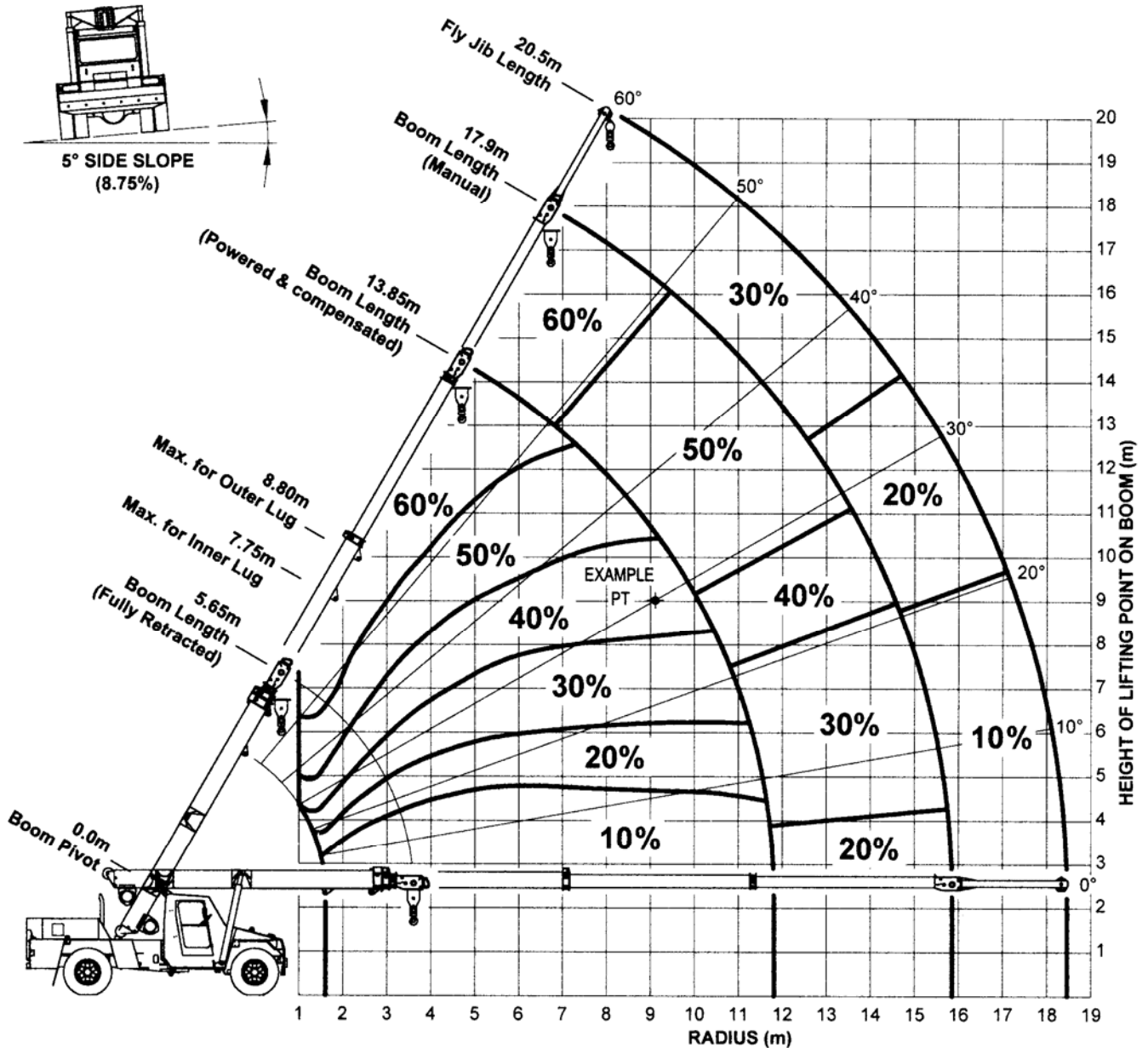


Figure 1: Percentage Deration Chart for 4WD 10/12, MAC 14, AT-14

Note:

1. Percentage deration chart is based on 66.6% stability as per AS 1418.5 with the crane on a firm side slope of 5° (8.75% Gradient).
2. The percentage deration is dependent upon the location of the lifting point on the boom.
3. The percentage deration should be applied to the SWL as read off the crane’s load chart for the applicable boom length, boom angle, radius and articulation angle.

Example (For AT-14 Crane, 10 tonne Rear Axle, Load Chart C1233B):

Lifting condition:

Boom Length: 13 m
 Boom Angle: 30°
 Radius: 9.1 m
 Articulation Angle: Greater than 10°

SWL (Level ground): 2000 kg (From crane load chart C1233B, for above lifting conditions)
 Percentage Deration: 40 % (From Figure 1: Percentage Deration Chart)

$$\begin{aligned}
 \text{SWL (5° Slide Slope)} &= \text{SWL (as per load chart)} - \text{Percentage Deration} \times \text{SWL (as per load chart)} / 100 \% \\
 &= 2000 \text{ kg} - 40\% \times 2000 \text{ kg} / 100\% \\
 &= 1200 \text{ kg}
 \end{aligned}$$

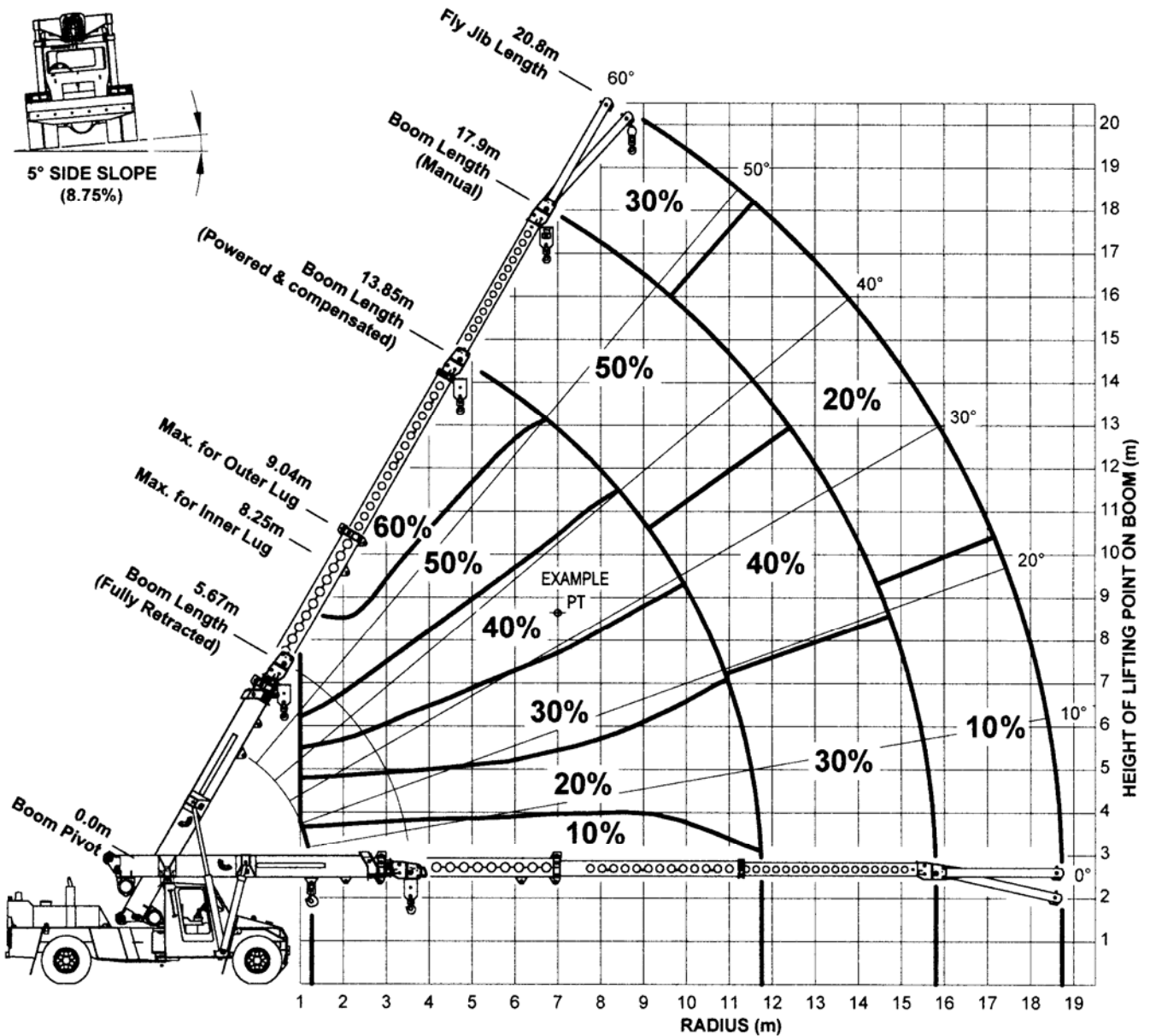


Figure 2: Percentage Deration Chart for 4WD 16, AT-18 & AT-20

Note:

1. Percentage deration chart is based on 66.6% stability as per AS 1418.5 with the crane on a firm side slope of 5° (8.75% Gradient).
2. The percentage deration is dependent upon the location of the lifting point on the boom.
3. The percentage deration should be applied to the SWL as read off the crane’s load chart for the applicable boom length, boom angle, radius and articulation angle.

Example (For AT-20 Crane, Load Chart 16C1320-):

Lifting condition:

Boom Length: 11.0 m
 Boom Angle: 34.0°
 Radius: 7.0 m
 Articulation Angle: Greater than 10°

SWL (Level ground): 3750 kg (From crane load chart 16C1320-, for above lifting conditions)
 Percentage Deration: 40 % (From Figure 2: Percentage Deration Chart)

$$\begin{aligned}
 \text{SWL (5° Slide Slope)} &= \text{SWL (as per load chart)} - \text{Percentage Deration} \times \text{SWL (as per load chart)} / 100 \% \\
 &= 3750 \text{ kg} - 40\% \times 3750 \text{ kg} / 100\% \\
 &= 2250 \text{ kg}
 \end{aligned}$$

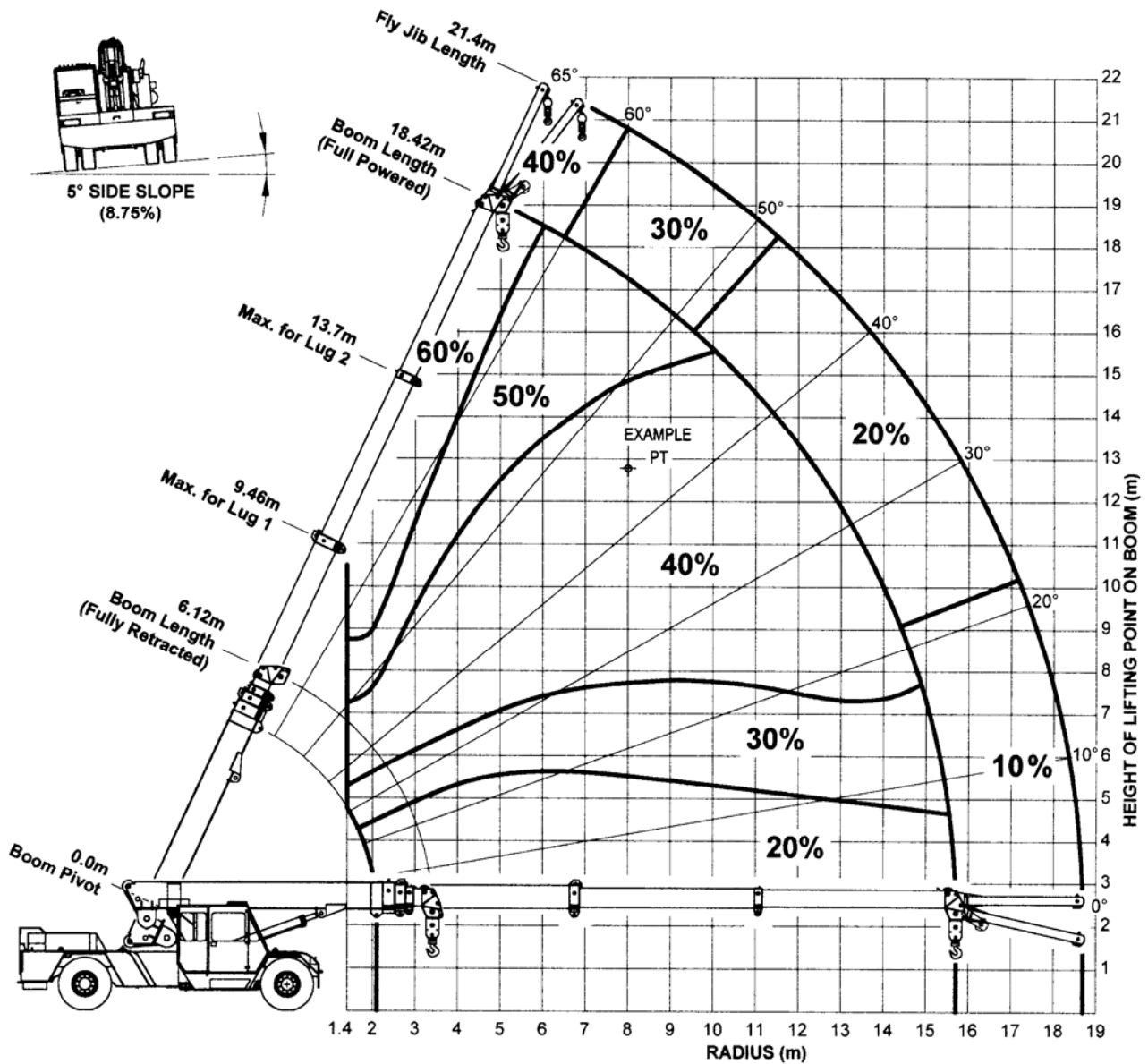


Figure 3: Percentage Deration Chart for MAC 25

Note:

1. Percentage deration chart is based on 66.6% stability as per AS 1418.5 with the crane on a firm side slope of 5° (8.75% Gradient).
2. The percentage deration is dependent upon the location of the lifting point on the boom.
3. The percentage deration should be applied to the SWL as read off the crane’s load chart for the applicable boom length, boom angle, radius, articulation angle and counterweight position.

Example (For MAC 25 Crane, Load Chart MXC1195-):

Lifting condition:

Boom Length: 15 m
 Boom Angle: 45°
 Radius: 8.0 m
 Articulation Angle: Greater than 10°
 Counterweight: Fitted on rear of crane.

SWL (Level ground): 3700 kg (From crane load chart MXC1195-, for above lifting conditions)
 Percentage Deration: 40 % (From Figure 3: Percentage Deration Chart)

$$\begin{aligned}
 \text{SWL (5° Slide Slope)} &= \text{SWL (as per load chart)} - \text{Percentage Deration} \times \text{SWL (as per load chart)} / 100 \% \\
 &= 3700 \text{ kg} - 40\% \times 3700 \text{ kg} / 100\% \\
 &= 2220 \text{ kg}
 \end{aligned}$$