

PULL FORCE CALCULATIONS FOR WINCHING OPERATIONS

OWN WEIGHT=

W= kg

R Rolling Resistance

R=

W/R= kg

Factors:

- 25 Smooth road
- 7 Grass
- 5 Gravel and wet sand
- 2 Soft Clay, Peat, Mud



G Gradient

G=

(WxG)/60= kg

Factor:

Gradient **G** in Degrees



D Damaged or Bogged Vehicle

D=

(WxD)/3= kg

Factors:

- 2 Two blocked axles / Vehicles wheels completely bogged down
- 1 Single blocked axle / Vehicle wheels half bogged down
- 0 No axle damage / Vehicle not bogged down



SUB-TOTAL =

ST= kg



25% Safety Factor

STx0,25= kg



TOTAL =

kg

EXAMPLE

Actual weight of vehicle W=14.000kg

Surface = Grass =Factor 7
W/R= 14.000/7 = **2.000kg**

Gradient = 1 Degree
(WxG)/60 = (14.000/1)/60 = **250kg** (rounded)

Vehicle not bogged down or damaged =
Factor 0
(WxD)/3 = (14.000x0)/3 = **0kg**

Sub-Total = 2.000+250+0 = **2.250kg**

Safety factor = 2.250 x 0,25 = **600kg**
(rounded)

TOTAL = 2.250 + 600 = **2.850kg**

