

14/05/20 - 1pm

VEHICLE TECHNOLOGY M4X003944

ANDREW WHITE 1803827

page 5 of 8

(4)(i) $F = ma$

$$F = 875 \times 7.5$$

$$F = \underline{\underline{6562.5 \text{ N}}}$$

(ii) Force per wheel = $\frac{6562.5}{2} = 3281.25 \text{ N}$

$$T = F_w \times R$$

$$T = 3281.25 \times 0.285 = 935.16 \text{ Nm}$$

$$T = F_s \times \mu \times r$$

$$\therefore F_s = \frac{T}{\mu \times r}$$

$$F_s = \frac{935.16}{0.42 \times 0.15} = 14843.81 \text{ N}$$

$$F_s = P \times A_s \times n$$

$$\therefore P = \frac{F_s}{A_s \times n} = \frac{14843.81}{\pi \left(\frac{0.015875}{2} \right)^2 \times 2} = \frac{4.783 \times 10^6 \text{ N/m}^2}{\cancel{37.497 \times 10^6}}$$

$$P = \frac{F_m}{A_m}$$

$$F_m = P \times A_m$$