Solution

$$F_0 = \frac{0.3V^2}{500+(\ln V)^3} - 0.02V \quad \text{——— (1)}$$

$$F_0 = mg = 3.5 \times 9.8 = 34.3 \quad \text{——— (2).}$$

Equating eqn 1 & 2

$$Mg = 34.3 = \frac{0.3V^2}{500+(\ln V)^3} - 0.02V$$

Making V^2 the subject of formula:

$$34.3 + 0.02V = \frac{0.3V^2}{500+(\ln V)^3}$$

$$0.3V^2 = (34.3+0.02V) * (500+(\ln V)^3)$$

$$V^2 = ((34.3+0.02V) * (500+(\ln V)^3))/0.3$$

$$V = \sqrt{((34.3+0.02V) * (500+(\ln V)^3))/0.3}$$

Initial guess value $= V_0 = 0.5 m/s$.

Absolute % relative error, $E_a(it\,1) \leq 1E-11$

MATLAB

1) Command window
2 - Clear
3 - Clc
4 - Close all
5 - Format
6 - Syms V
7 - V=0.5
8 - for i = 1:inf
9 - i+e(i+1) = i;
10 - V(i+1) = ((((34.3+(0.02+V(i)))*(500+(log(V(i)))^3))/0.3^0.5
11 - Ea(i+1) = abs((V(i+1)-V(i))/V(i+1))*100;
12 - if Ea(i+1)<=1E-11
13 - break
14 - End
15 ~~End~~ end

table = [i+e 'v' Ea']

The estimated terminal velocity is 304.07 m/s

Substituting in eqn(i) Fo = 34.3.