

Appendix A

Mathematical Form of the Required Freight Rate

Rfr =

$$\begin{aligned}
 & 4.08163 \cdot 10^{-7} J_2 + H_0.191743 + 0.350025 Cb - 0.000139214 Ntd \cdot x_1 \cdot x_2 + 4.998 \cdot 10^{-6} \cdot x_1 \cdot x_2 \cdot x_3 - \\
 & 0.0000461634 Cb \cdot x_1 \cdot x_2 \cdot x_3 \cdot H - 0.3572 - 0.0187 \cdot x_1 L + \frac{291.667}{x_5} \\
 & 14000. + S_s + 3817.27 Hx_1 \cdot x_2 \cdot x_3 L^{0.166667} + 790.174 Hx_1 \cdot x_2 \cdot x_3 L^{0.543} + 230.286 Hx_1 \cdot x_2 \cdot x_3 L^{0.6516} + \\
 & 178.724 Hx_1 \cdot x_2 \cdot x_3 L^{0.724} + 3.04265 Hx_1 \cdot x_2 \cdot x_3 L^{1.003} + 1.50708 Cb Hx_1 \cdot x_2 \cdot x_3 L^{1.003} + \\
 & 0.00282358 J - 8.3 + \frac{x_1^{1.691}}{x_3} Hx_1 \cdot x_2 \cdot x_3 L^{1.003} + 0.00139857 Cb J - 8.3 + \frac{x_1^{1.691}}{x_3} Hx_1 \cdot x_2 \cdot x_3 L^{1.003} + \\
 & 3.13404 \cdot \frac{J}{K} H_1 + 0.49532 Cb L \cdot \frac{J}{K} + 0.000928 J - 8.3 + \frac{x_1^{1.691}}{x_3} Hx_1 \cdot x_2 \cdot x_3 L^{1.003} \cdot \frac{V}{W}^{0.85} + \\
 & H_5000.8 + 261.8 \cdot x_1 L \cdot x_5 L \cdot H_{104.183} + H_0.522657 - 0.350025 Cb L \cdot x_5 + x_1 H_5.45417 + \\
 & H_0.0374 + 0.000139214 Ntd \cdot x_2 + H - 4.998 \cdot 10^{-6} + 0.0000461634 Cb L \cdot x_2 \cdot x_3 L \cdot x_5 L L + \\
 & H_2.03 H_0.3572 + 0.0187 \cdot x_1 L \cdot x_1 \cdot x_2 \cdot x_3 \cdot x_5 L \cdot H_{104.183} + H_0.522657 - 0.350025 Cb L \cdot x_5 + x_1 H_5.45417 + \\
 & H_0.0374 + 0.000139214 Ntd \cdot x_2 + H - 4.998 \cdot 10^{-6} + 0.0000461634 Cb L \cdot x_2 \cdot x_3 L \cdot x_5 L L + \\
 & H_{211418}. AT \cdot c_6 H_{19.1016} + 1. \cdot x_1 L \cdot x_5^3 \cdot L \cdot H_{748369}. + H_{3754.34} - 2514.29 Cb L \cdot x_5 + \\
 & x_1 H_{39178.3} + H_{268.651} + 1. Ntd \cdot x_2 + H - 0.0359016 + 0.331601 Cb L \cdot x_2 \cdot x_3 L \cdot x_5 L L - \\
 & I_{193.328} \cdot \frac{Cm}{Cm} \cdot x_1 H_{19.1016} + 1. \cdot x_1 L \cdot x_2 \cdot x_5^3 \cdot M' \cdot H_{748369}. + H_{3754.34} - 2514.29 Cb L \cdot x_5 + \\
 & x_1 H_{39178.3} + H_{268.651} + 1. Ntd \cdot x_2 + H - 0.0359016 + 0.331601 Cb L \cdot x_2 \cdot x_3 L \cdot x_5 L L + \\
 & H_{124.041} Cm^{3 \cdot 2} \cdot x_1 H_{19.1016} + 1. \cdot x_1 L \cdot x_2 \cdot x_5^3 \cdot L \cdot H_{748369}. + H_{3754.34} - 2514.29 Cb L \cdot x_5 + \\
 & x_1 H_{39178.3} + H_{268.651} + 1. Ntd \cdot x_2 + H - 0.0359016 + 0.331601 Cb L \cdot x_2 \cdot x_3 L \cdot x_5 L L - \\
 & I_{160.187} \cdot \frac{Cm}{Cm} \cdot Cw \cdot x_1 H_{19.1016} + 1. \cdot x_1 L \cdot x_2 \cdot x_5^3 \cdot M' \cdot H_{748369}. + H_{3754.34} - 2514.29 Cb L \cdot x_5 + \\
 & x_1 H_{39178.3} + H_{268.651} + 1. Ntd \cdot x_2 + H - 0.0359016 + 0.331601 Cb L \cdot x_2 \cdot x_3 L \cdot x_5 L L + \\
 & I_{565.838} \cdot \frac{Cm}{Cm} \cdot x_1 H_{19.1016} + 1. \cdot x_1 L \cdot x_2 \cdot x_5^3 \cdot M' \cdot H_{100}. + x_1 L^{0.16} H_{748369}. + H_{3754.34} - 2514.29 Cb L \\
 & x_5 + x_1 H_{39178.3} + H_{268.651} + 1. Ntd \cdot x_2 + H - 0.0359016 + 0.331601 Cb L \cdot x_2 \cdot x_3 L \cdot x_5 L L L - \\
 & H_{363.047} Cm^{3 \cdot 2} \cdot x_1 H_{19.1016} + 1. \cdot x_1 L \cdot x_2 \cdot x_5^3 \cdot L \cdot H_{100}. + x_1 L^{0.16} H_{748369}. + H_{3754.34} - 2514.29 Cb L \\
 & x_5 + x_1 H_{39178.3} + H_{268.651} + 1. Ntd \cdot x_2 + H - 0.0359016 + 0.331601 Cb L \cdot x_2 \cdot x_3 L \cdot x_5 L L L + \\
 & I_{468.84} \cdot \frac{Cm}{Cm} \cdot Cw \cdot x_1 H_{19.1016} + 1. \cdot x_1 L \cdot x_2 \cdot x_5^3 \cdot M' \\
 & H_{100}. + x_1 L^{0.16} H_{748369}. + H_{3754.34} - 2514.29 Cb L \cdot x_5 + \\
 & x_1 H_{39178.3} + H_{268.651} + 1. Ntd \cdot x_2 + H - 0.0359016 + 0.331601 Cb L \cdot x_2 \cdot x_3 L \cdot x_5 L L L + \\
 & I_{1.50262} \cdot \frac{Cm}{Cm} \cdot x_1 H_{19.1016} + 1. \cdot x_1 L \cdot x_2^2 \cdot x_5^3 \cdot M' \cdot Hx_4 H_{748369}. + H_{3754.34} - 2514.29 Cb L \cdot x_5 + \\
 & x_1 H_{39178.3} + H_{268.651} + 1. Ntd \cdot x_2 + H - 0.0359016 + 0.331601 Cb L \cdot x_2 \cdot x_3 L \cdot x_5 L L L - \\
 & I_{4.39791} \cdot \frac{Cm}{Cm} \cdot x_1 H_{19.1016} + 1. \cdot x_1 L \cdot x_2^2 \cdot x_5^3 \cdot M' \\
 & H_{100}. + x_1 L^{0.16} x_4 H_{748369}. + H_{3754.34} - 2514.29 Cb L \cdot x_5 + \\
 & x_1 H_{39178.3} + H_{268.651} + 1. Ntd \cdot x_2 + H - 0.0359016 + 0.331601 Cb L \cdot x_2 \cdot x_3 L \cdot x_5 L L L + \\
 & I_{1149.27} \cdot \frac{Cm}{Cm} \cdot x_1 H_{19.1016} + 1. \cdot x_1 L \cdot x_4 \cdot x_5^3 \cdot M' \cdot H_{100}. + x_1 L^{0.16} H_{748369}. + H_{3754.34} - 2514.29 Cb L
 \end{aligned}$$

$$\begin{aligned}
& x^5 + x^1 \#39178.3 + \#268.651 + 1. \text{Ntd } x^2 + \# - 0.0359016 + 0.331601 \text{ Cbl } x^2 x^3 x^5 \text{LLL} - \\
& 1392.666 \cdot \frac{\text{|||||}}{\text{Cm}} x^1 \#19.1016 + 1. x^1 L x^4 x^5 \cdot \#748369. + \#3754.34 - 2514.29 \text{ Cbl } x^5 + \\
& x^1 \#39178.3 + \#268.651 + 1. \text{Ntd } x^2 + \# - 0.0359016 + 0.331601 \text{ Cbl } x^2 x^3 x^5 \text{LL} + \\
& \#248.082 \text{ Cm}^{3 \cdot 2} x^1 \#19.1016 + 1. x^1 L x^4 x^5 \cdot \#748369. + \#3754.34 - 2514.29 \text{ Cbl } x^5 + \\
& x^1 \#39178.3 + \#268.651 + 1. \text{Ntd } x^2 + \# - 0.0359016 + 0.331601 \text{ Cbl } x^2 x^3 x^5 \text{L} - \\
& 1320.374 \cdot \frac{\text{|||||}}{\text{Cm}} \text{ Cw } x^1 \#19.1016 + 1. x^1 L x^4 x^5 \cdot \#748369. + \#3754.34 - 2514.29 \text{ Cbl } x^5 + \\
& x^1 \#39178.3 + \#268.651 + 1. \text{Ntd } x^2 + \# - 0.0359016 + 0.331601 \text{ Cbl } x^2 x^3 x^5 \text{LL} - \\
& \#726.093 \text{ Cm}^{3 \cdot 2} x^1 \#19.1016 + 1. x^1 L x^4 x^5 \cdot \#748369. + \#3754.34 - 2514.29 \text{ Cbl} \\
& x^5 + x^1 \#39178.3 + \#268.651 + 1. \text{Ntd } x^2 + \# - 0.0359016 + 0.331601 \text{ Cbl } x^2 x^3 x^5 \text{LLL} + \\
& 1937.68 \cdot \frac{\text{|||||}}{\text{Cm}} \text{ Cw } x^1 \#19.1016 + 1. x^1 L x^4 x^5 \cdot \#748369. + \#3754.34 - 2514.29 \text{ Cbl } x^5 + \\
& \#1100. + x^1 L^{0.16} \#748369. + \#3754.34 - 2514.29 \text{ Cbl } x^5 + \\
& x^1 \#39178.3 + \#268.651 + 1. \text{Ntd } x^2 + \# - 0.0359016 + 0.331601 \text{ Cbl } x^2 x^3 x^5 \text{LLL} -
\end{aligned}$$

$$\begin{aligned}
& \left. \begin{array}{l} 8.40505 \cdot 10^{13} \text{ AT } c^{7 \cdot 3.78613} \text{ Cb } \bar{a} \wedge \\ \text{K} \end{array} \right\} - 1.41435 \text{ \$ } \frac{\text{ABT}^{1.5}}{-hb + x^4 + \text{ABT } x^2 x^4} - \\
& \frac{5.08183 c^{16}}{x^1} - \frac{24.3584 x^2}{x^1} + \frac{0.0713525 x^1}{x^4} - \frac{8.90612 \text{ Cb } x^2 x^4}{\text{HCb } x^1 x^2 x^4 L^{0.666667}} + \\
& 0. \bar{a} \cdot \frac{-13.0532}{x^1} \text{ CosB } \frac{-13.3425 + 53.5923 \text{ Cp}}{x^1} x^1 \#19.1016 + 1. x^1 L J \frac{x^4}{x^2} x^5 \cdot \frac{1.07961}{x^5}
\end{aligned}$$

$$\begin{aligned}
& \# \text{Cm } \#90. - \text{hal}^{1.37565} \#2.25684 \cdot 10^6 + \#11321.9 - 7582.29 \text{ Cbl } x^5 + \\
& x^1 \#118149. + \#810.165 + 3.01567 \text{ Ntd } x^2 + \# - 0.108267 + 1. \text{ Cbl } x^2 x^3 x^5 \text{LLL} +
\end{aligned}$$

$$\begin{aligned}
& \left. \begin{array}{l} 1.05063 \cdot 10^{14} c^{7 \cdot 3.78613} \text{ Cb } \bar{a} \wedge \\ \text{K} \end{array} \right\} - 1.41435 \text{ \$ } \frac{\text{ABT}^{1.5}}{-hb + x^4 + \text{ABT } x^2 x^4} - \frac{5.08183 c^{16}}{x^1} - \\
& \frac{24.3584 x^2}{x^1} + \frac{0.0713525 x^1}{x^4} - \frac{8.90612 \text{ Cb } x^2 x^4}{\text{HCb } x^1 x^2 x^4 L^{0.666667}} + 0. \bar{a} \cdot \frac{-13.0532}{x^1} \\
& \text{CosB } \frac{-13.3425 + 53.5923 \text{ Cp}}{x^1} x^1 \#19.1016 + 1. x^1 L x^2 x^4 J \frac{x^4}{x^2} x^5 \cdot \frac{1.07961}{x^5}
\end{aligned}$$

$$\begin{aligned}
& \# \#90. - \text{hal}^{1.37565} \#2.25684 \cdot 10^6 + \#11321.9 - 7582.29 \text{ Cbl } x^5 + \\
& x^1 \#118149. + \#810.165 + 3.01567 \text{ Ntd } x^2 + \# - 0.108267 + 1. \text{ Cbl } x^2 x^3 x^5 \text{LLL} - \\
& \#3110.69 \text{ ABT } \#19.1016 + 1. x^1 L x^5 \cdot \#748369. + \#3754.34 - 2514.29 \text{ Cbl } x^5 + \\
& x^1 \#118149. + \#810.165 + 3.01567 \text{ Ntd } x^2 + \# - 0.108267 + 1. \text{ Cbl } x^2 x^3 x^5 \text{LLL} +
\end{aligned}$$

$$\left. \begin{array}{l} 66.4896 \text{ ABT } \text{Cb}^3 \cdot \bar{a} \\ \text{K} \end{array} \right\} - 1.41435 \text{ \$ } \frac{\text{ABT}^{1.5}}{-hb+x^4+ \text{ABT } x^2 x^4} \cdot \frac{\text{|||||}}{x^1} \#19.1016 + 1. x^1 L x^5 \cdot \#748369.$$

$$\begin{aligned}
& \#2.25684 \cdot 10^6 + \#11321.9 - 7582.29 \text{ Cbl } x^5 + \\
& x^1 \#118149. + \#810.165 + 3.01567 \text{ Ntd } x^2 + \# - 0.108267 + 1. \text{ Cbl } x^2 x^3 x^5 \text{LL} -
\end{aligned}$$

$$\left. \begin{array}{l} 1662.24 \text{ ABT } c^4 \text{Cb}^3 \cdot \bar{a} \\ \text{K} \end{array} \right\} - 1.41435 \text{ \$ } \frac{\text{ABT}^{1.5}}{-hb+x^4+ \text{ABT } x^2 x^4} \cdot \frac{\text{|||||}}{x^1} \#19.1016 + 1. x^1 L x^5 \cdot \#748369.$$

$$\#2.25684 \cdot 10^6 + \#11321.9 - 7582.29 \text{ Cbl } x^5 +$$

$$\begin{aligned}
& x1 \text{H}118149. + \text{H}810.165 + 3.01567 \text{Ntd} x2 + \text{H}-0.108267 + 1. \text{Cbl} x2 x3L x5LL + \\
& \text{H}9104.46 \text{ABT} \text{H}19.1016 + 1. x1L x5^3 L \cdot \\
& \text{H}2.25684 \text{Cbl} \text{H}100. + x1L^{0.16} \text{H}2.25684 \text{H}11321.9 - 7582.29 \text{Cbl} x5 + \\
& x1 \text{H}118149. + \text{H}810.165 + 3.01567 \text{Ntd} x2 + \text{H}-0.108267 + 1. \text{Cbl} x2 x3L x5LLL - \\
& 1578.353 \text{Cb} \cdot \text{Cm} \text{H}19.1016 + 1. x1L x2 x5^3 \text{H}2.25684 \text{H}11321.9 - 7582.29 \text{Cbl} x5 + \\
& x1 \text{H}118149. + \text{H}810.165 + 3.01567 \text{Ntd} x2 + \text{H}-0.108267 + 1. \text{Cbl} x2 x3L x5LL +
\end{aligned}$$

$$12.4617 \text{Cb}^4 \cdot \text{Cm} \bar{a}^{-1.41435} \$ \frac{\text{Apr}15}{-\text{hb}+x4+ \text{ABT} x2x4} x1^{3 \cdot 2} \text{H}19.1016 + 1. x1L x2 x5^3 \text{H}$$

$$\begin{aligned}
& \text{H}2.25684 \text{H}11321.9 - 7582.29 \text{Cbl} x5 + \\
& x1 \text{H}118149. + \text{H}810.165 + 3.01567 \text{Ntd} x2 + \text{H}-0.108267 + 1. \text{Cbl} x2 x3L x5LL -
\end{aligned}$$

$$311.541 c4 \text{Cb}^4 \cdot \text{Cm} \bar{a}^{-1.41435} \$ \frac{\text{Apr}15}{-\text{hb}+x4+ \text{ABT} x2x4} x1^{3 \cdot 2} \text{H}19.1016 + 1. x1L x2 x5^3 \text{H}$$

$$\begin{aligned}
& \text{H}2.25684 \text{H}11321.9 - 7582.29 \text{Cbl} x5 + \\
& x1 \text{H}118149. + \text{H}810.165 + 3.01567 \text{Ntd} x2 + \text{H}-0.108267 + 1. \text{Cbl} x2 x3L x5LL +
\end{aligned}$$

$$12.362 \text{Cb}^5 \cdot \text{Cm} \bar{a}^{-1.41435} \$ \frac{\text{Apr}15}{-\text{hb}+x4+ \text{ABT} x2x4} x1^{3 \cdot 2} \text{H}19.1016 + 1. x1L x2 x5^3 \text{H}$$

$$\begin{aligned}
& \text{H}2.25684 \text{H}11321.9 - 7582.29 \text{Cbl} x5 + \\
& x1 \text{H}118149. + \text{H}810.165 + 3.01567 \text{Ntd} x2 + \text{H}-0.108267 + 1. \text{Cbl} x2 x3L x5LL -
\end{aligned}$$

$$309.051 c4 \text{Cb}^5 \cdot \text{Cm} \bar{a}^{-1.41435} \$ \frac{\text{Apr}15}{-\text{hb}+x4+ \text{ABT} x2x4} x1^{3 \cdot 2} \text{H}19.1016 + 1. x1L x2 x5^3 \text{H}$$

$$\begin{aligned}
& \text{H}2.25684 \text{H}11321.9 - 7582.29 \text{Cbl} x5 + \\
& x1 \text{H}118149. + \text{H}810.165 + 3.01567 \text{Ntd} x2 + \text{H}-0.108267 + 1. \text{Cbl} x2 x3L x5LL -
\end{aligned}$$

$$7.99551 \text{Cb}^4 \cdot \text{Cm}^{3 \cdot 2} \bar{a}^{-1.41435} \$ \frac{\text{Apr}15}{-\text{hb}+x4+ \text{ABT} x2x4} x1^{3 \cdot 2} \text{H}19.1016 + 1. x1L x2 x5^3 \text{H}$$

$$\begin{aligned}
& \text{H}2.25684 \text{H}11321.9 - 7582.29 \text{Cbl} x5 + \\
& x1 \text{H}118149. + \text{H}810.165 + 3.01567 \text{Ntd} x2 + \text{H}-0.108267 + 1. \text{Cbl} x2 x3L x5LL +
\end{aligned}$$

$$199.888 c4 \text{Cb}^4 \cdot \text{Cm}^{3 \cdot 2} \bar{a}^{-1.41435} \$ \frac{\text{Apr}15}{-\text{hb}+x4+ \text{ABT} x2x4} x1^{3 \cdot 2} \text{H}19.1016 + 1. x1L x2 x5^3 \text{H}$$

$$\begin{aligned}
& \text{H}2.25684 \text{H}11321.9 - 7582.29 \text{Cbl} x5 + \\
& x1 \text{H}118149. + \text{H}810.165 + 3.01567 \text{Ntd} x2 + \text{H}-0.108267 + 1. \text{Cbl} x2 x3L x5LL +
\end{aligned}$$

$$10.3254 \text{Cb}^4 \cdot \text{Cm} \text{Cw} \bar{a}^{-1.41435} \$ \frac{\text{Apr}15}{-\text{hb}+x4+ \text{ABT} x2x4} x1^{3 \cdot 2} \text{H}19.1016 + 1. x1L x2 x5^3 \text{H}$$

$$\begin{aligned}
& \text{H}2.25684 \text{H}11321.9 - 7582.29 \text{Cbl} x5 + \\
& x1 \text{H}118149. + \text{H}810.165 + 3.01567 \text{Ntd} x2 + \text{H}-0.108267 + 1. \text{Cbl} x2 x3L x5LL -
\end{aligned}$$

$$258.136 c4 \text{Cb}^4 \cdot \text{Cm} \text{Cw} \bar{a}^{-1.41435} \$ \frac{\text{Apr}15}{-\text{hb}+x4+ \text{ABT} x2x4} x1^{3 \cdot 2} \text{H}19.1016 + 1. x1L x2 x5^3 \text{H}$$

$$\text{H}2.25684 \text{H}11321.9 - 7582.29 \text{Cbl} x5 +$$

$$\begin{aligned}
 & x1 \text{H}118149. + \text{H}810.165 + 3.01567 \text{Ntd} x2 + \text{H}-0.108267 + 1. \text{Cbl} x2 x3L x5LL + \\
 & 11692.74 \text{Cb}^4 \cdot \frac{\text{Cm}^{\text{|||||}}}{\text{Cm}^{\text{|||||}}} x1 \text{H}19.1016 + 1. x1L x2 x5^3 \text{M}' \\
 & \text{H}100. + x1L^{0.16} \text{H}2.25684 \text{ } \hat{\text{ }} 10^6 + \text{H}11321.9 - 7582.29 \text{Cbl} x5 + \\
 & x1 \text{H}118149. + \text{H}810.165 + 3.01567 \text{Ntd} x2 + \text{H}-0.108267 + 1. \text{Cbl} x2 x3L x5LLL -
 \end{aligned}$$

$$\left. \begin{aligned}
 & 0.0968568 \text{Cb}^4 \cdot \frac{\text{Cm}^{\text{|||||}}}{\text{Cm}^{\text{|||||}}} \bar{a}^{-1.41435} \$ \frac{\text{Apr}1.5}{-\text{hb}+x4+ \text{ABT} x2x4} x1^{3*2} \text{H}19.1016 + 1. x1L x2^2 x5^3 \text{M}' \end{aligned} \right\}$$

$$\begin{aligned}
 & \text{H}x4 \text{H}2.25684 \text{ } \hat{\text{ }} 10^6 + \text{H}11321.9 - 7582.29 \text{Cbl} x5 + \\
 & x1 \text{H}118149. + \text{H}810.165 + 3.01567 \text{Ntd} x2 + \text{H}-0.108267 + 1. \text{Cbl} x2 x3L x5LLL +
 \end{aligned}$$

$$\left. \begin{aligned}
 & 2.42142 \text{c}4 \text{Cb}^4 \cdot \frac{\text{Cm}^{\text{|||||}}}{\text{Cm}^{\text{|||||}}} \bar{a}^{-1.41435} \$ \frac{\text{Apr}1.5}{-\text{hb}+x4+ \text{ABT} x2x4} x1^{3*2} \text{H}19.1016 + 1. x1L x2^2 x5^3 \text{M}' \end{aligned} \right\}$$

$$\begin{aligned}
 & \text{H}x4 \text{H}2.25684 \text{ } \hat{\text{ }} 10^6 + \text{H}11321.9 - 7582.29 \text{Cbl} x5 + \\
 & x1 \text{H}118149. + \text{H}810.165 + 3.01567 \text{Ntd} x2 + \text{H}-0.108267 + 1. \text{Cbl} x2 x3L x5LLL - \\
 & 11156.71 \text{Cb}^4 \cdot \frac{\text{Cm}^{\text{|||||}}}{\text{Cm}^{\text{|||||}}} x1 \text{H}19.1016 + 1. x1L x4 x5^3 \text{M}' \text{H}2.25684 \text{ } \hat{\text{ }} 10^6 + \text{H}11321.9 - 7582.29 \text{Cbl} x5 + \\
 & x1 \text{H}118149. + \text{H}810.165 + 3.01567 \text{Ntd} x2 + \text{H}-0.108267 + 1. \text{Cbl} x2 x3L x5LL +
 \end{aligned}$$

$$\left. \begin{aligned}
 & 25.3107 \text{Cb}^4 \cdot \frac{\text{Cm}^{\text{|||||}}}{\text{Cm}^{\text{|||||}}} \bar{a}^{-1.41435} \$ \frac{\text{Apr}1.5}{-\text{hb}+x4+ \text{ABT} x2x4} x1^{3*2} \text{H}19.1016 + 1. x1L x4 x5^3 \text{M}' \end{aligned} \right\}$$

$$\begin{aligned}
 & \text{H}2.25684 \text{ } \hat{\text{ }} 10^6 + \text{H}11321.9 - 7582.29 \text{Cbl} x5 + \\
 & x1 \text{H}118149. + \text{H}810.165 + 3.01567 \text{Ntd} x2 + \text{H}-0.108267 + 1. \text{Cbl} x2 x3L x5LL -
 \end{aligned}$$

$$\left. \begin{aligned}
 & 632.768 \text{c}4 \text{Cb}^4 \cdot \frac{\text{Cm}^{\text{|||||}}}{\text{Cm}^{\text{|||||}}} \bar{a}^{-1.41435} \$ \frac{\text{Apr}1.5}{-\text{hb}+x4+ \text{ABT} x2x4} x1^{3*2} \text{H}19.1016 + 1. x1L x4 x5^3 \text{M}' \end{aligned} \right\}$$

$$\begin{aligned}
 & \text{H}2.25684 \text{ } \hat{\text{ }} 10^6 + \text{H}11321.9 - 7582.29 \text{Cbl} x5 + \\
 & x1 \text{H}118149. + \text{H}810.165 + 3.01567 \text{Ntd} x2 + \text{H}-0.108267 + 1. \text{Cbl} x2 x3L x5LL +
 \end{aligned}$$

$$\left. \begin{aligned}
 & 24.7241 \text{Cb}^5 \cdot \frac{\text{Cm}^{\text{|||||}}}{\text{Cm}^{\text{|||||}}} \bar{a}^{-1.41435} \$ \frac{\text{Apr}1.5}{-\text{hb}+x4+ \text{ABT} x2x4} x1^{3*2} \text{H}19.1016 + 1. x1L x4 x5^3 \text{M}' \end{aligned} \right\}$$

$$\begin{aligned}
 & \text{H}2.25684 \text{ } \hat{\text{ }} 10^6 + \text{H}11321.9 - 7582.29 \text{Cbl} x5 + \\
 & x1 \text{H}118149. + \text{H}810.165 + 3.01567 \text{Ntd} x2 + \text{H}-0.108267 + 1. \text{Cbl} x2 x3L x5LL -
 \end{aligned}$$

$$\left. \begin{aligned}
 & 618.101 \text{c}4 \text{Cb}^5 \cdot \frac{\text{Cm}^{\text{|||||}}}{\text{Cm}^{\text{|||||}}} \bar{a}^{-1.41435} \$ \frac{\text{Apr}1.5}{-\text{hb}+x4+ \text{ABT} x2x4} x1^{3*2} \text{H}19.1016 + 1. x1L x4 x5^3 \text{M}' \end{aligned} \right\}$$

$$\begin{aligned}
 & \text{H}2.25684 \text{ } \hat{\text{ }} 10^6 + \text{H}11321.9 - 7582.29 \text{Cbl} x5 + \\
 & x1 \text{H}118149. + \text{H}810.165 + 3.01567 \text{Ntd} x2 + \text{H}-0.108267 + 1. \text{Cbl} x2 x3L x5LL -
 \end{aligned}$$

$$\left. \begin{aligned}
 & 15.991 \text{Cb}^4 \cdot \text{Cm}^{3*2} \bar{a}^{-1.41435} \$ \frac{\text{Apr}1.5}{-\text{hb}+x4+ \text{ABT} x2x4} x1^{3*2} \text{H}19.1016 + 1. x1L x4 x5^3 \text{M}' \end{aligned} \right\}$$

$$\begin{aligned}
 & \text{H}2.25684 \text{ } \hat{\text{ }} 10^6 + \text{H}11321.9 - 7582.29 \text{Cbl} x5 + \\
 & x1 \text{H}118149. + \text{H}810.165 + 3.01567 \text{Ntd} x2 + \text{H}-0.108267 + 1. \text{Cbl} x2 x3L x5LL +
 \end{aligned}$$

$$\left. \begin{aligned}
 & 399.775 \text{c}4 \text{Cb}^4 \cdot \text{Cm}^{3*2} \bar{a}^{-1.41435} \$ \frac{\text{Apr}1.5}{-\text{hb}+x4+ \text{ABT} x2x4} x1^{3*2} \text{H}19.1016 + 1. x1L x4 x5^3 \text{M}' \end{aligned} \right\}$$

$$\begin{aligned}
 & \text{H}2.25684 \text{ } \hat{\text{ }} 10^6 + \text{H}11321.9 - 7582.29 \text{Cbl} x5 +
 \end{aligned}$$

$$\begin{aligned}
& x1 \#118149. + \#810.165 + 3.01567 \text{Ntd } x2 + \#-0.108267 + 1. \text{Cbl } x2 \ x3L \ x5LL + \\
& \left. \begin{aligned} & 20.6509 \text{Cb}^4 \cdot \frac{\text{ABT}^{1.5}}{\text{Cm} \ \text{Cw} \ \bar{a}^{-1.41435} \$ \frac{-\text{hb}+x4+}{\text{ABT} \ x2 \ x4}} x1^{3 \cdot 2} \#19.1016 + 1. \ x1L \ x4 \ x5^3 \end{aligned} \right\} \\
& \#2.25684 \cdot 10^6 + \#11321.9 - 7582.29 \text{Cbl } x5 + \\
& x1 \#118149. + \#810.165 + 3.01567 \text{Ntd } x2 + \#-0.108267 + 1. \text{Cbl } x2 \ x3L \ x5LL - \\
& \left. \begin{aligned} & 516.272 \text{c4 } \text{Cb}^4 \cdot \frac{\text{ABT}^{1.5}}{\text{Cm} \ \text{Cw} \ \bar{a}^{-1.41435} \$ \frac{-\text{hb}+x4+}{\text{ABT} \ x2 \ x4}} x1^{3 \cdot 2} \#19.1016 + 1. \ x1L \ x4 \ x5^3 \end{aligned} \right\} \\
& \#2.25684 \cdot 10^6 + \#11321.9 - 7582.29 \text{Cbl } x5 + \\
& x1 \#118149. + \#810.165 + 3.01567 \text{Ntd } x2 + \#-0.108267 + 1. \text{Cbl } x2 \ x3L \ x5LL + \\
& 13385.48 \text{Cb} \cdot \frac{\text{ABT}^{1.5}}{\text{Cm}} x1 \#19.1016 + 1. \ x1L \ x4 \ x5^3 \cdot \# \\
& \#100. + x1L^{0.16} \#2.25684 \cdot 10^6 + \#11321.9 - 7582.29 \text{Cbl } x5 + \\
& x1 \#118149. + \#810.165 + 3.01567 \text{Ntd } x2 + \#-0.108267 + 1. \text{Cbl } x2 \ x3L \ x5LLL + \\
& \left. \begin{aligned} & 886746. \text{ABT}^{1.5} \bar{a}^{-\frac{0.56632}{\text{ABT} \ x2 \ x4}} \#19.1016 + 1. \ x1L \ x5 \end{aligned} \right\} \\
& \left. \begin{aligned} & -2.45175 \ \text{ABT} - 9.807 \text{hb} + 9.807 \ x4 + 0.0396911 \ x5^2 \end{aligned} \right\} \\
& \#748369. + \#3754.34 - 2514.29 \text{Cbl } x5 + \\
& x1 \#39178.3 + \#268.651 + 1. \text{Ntd } x2 + \#-0.0359016 + 0.331601 \text{Cbl } x2 \ x3L \ x5LL \\
& \left. \begin{aligned} & 3.77918 + 1. \left. \begin{aligned} & -2.45175 \ \text{ABT} - 9.807 \text{hb} + 9.807 \ x4 + 0.0396911 \ x5^2 \end{aligned} \right\} + \end{aligned} \right\} \\
& 22902.9 \left. \begin{aligned} & 2.26041 \ \#x1 \ x2 \ x3L^{0.166667} + 0.537397 \ x5 \end{aligned} \right\} - \left. \begin{aligned} & \text{Cm} \ \#90. - \text{hal}^{1.37585} \end{aligned} \right\} 1.78933 \cdot 10^{10} \\
& c7^{3.78613} \text{Cb} \ \bar{a}^{\frac{0.9}{x1 \ x4}} \left. \begin{aligned} & 0.0713525 \ x1^2 - 5.08183 \ \text{c16} \ x1 \ x4 - \\ & 24.3584 \ x2 \ x4 - 8.90612 \ x4 \ \# \text{Cb} \ x1 \ x2 \ x4L^{0.333333} - \\ & 1.41435 \ x1 \ x4 \$ \frac{\text{ABT}^{1.5}}{-\text{hb} + x4 + \text{ABT} \ x2 \ x4} \left. \begin{aligned} & \frac{x5}{x1} \end{aligned} \right\}^{0.9} \\ & 0. \bar{a}^{-\frac{12.9532}{x1}} \text{CosB} \frac{-13.3425 + 53.5923 \ \text{Cb}}{1} \left. \begin{aligned} & \frac{x5}{x1} \end{aligned} \right\} x1 \\ & \left. \begin{aligned} & \frac{x4}{x2}^{1.07961} \ \#1. \ \text{AT} - 1.25 \ \text{Cm} \ x2 \ x4L + 135.73 \ \text{AT} \ \text{c6} \end{aligned} \right\}
\end{aligned}$$

$$x^5 + 135.73 - 0.00205 - 0.00109545 H - 0.04 + 1. c4L Cb^4$$

$$\bar{a}^{-1.41435} \left(\frac{ABT^{1.5}}{-hb+x^4 + ABT x^2 x^4} \right) \cdot \frac{1}{x^1} + \frac{0.006}{H100. + x1L^{0.16}}$$

$$J \frac{2.38 ABT}{Cb} + C_m x1 J0.453 + 0.4425 Cb - 0.2862 C_m + 0.3696 C_w -$$

$$\frac{0.003467 x^2}{x^4} Hx^2 + 2. x4LN x5^2 + 569.292 ABT^{1.5} \bar{a}^{-0.56632} \left(\frac{ABT}{-1.5hb+x^4} \right)$$

$$-2.45175 ABT - 9.807 hb + 9.807 x^4 + 0.0396911 x5^2$$

$$3.77918 + 1.$$

$$-2.45175 ABT - 9.807 hb + 9.807 x^4 + 0.0396911 x5^2$$

$$10.1798 + 0.93 + \frac{H1. - Cpl^{0.60247}}{k} 0.487118 H1. + 0.011 Csternl$$

$$1. - Cp + \frac{0.121563}{-1.4 Cp} J \frac{x^2}{x1} \frac{1.06806}{Cb x^2 x^4} \frac{0.36486}{x1^2}$$

$$J \frac{x^4}{x1} \frac{0.46106 W}{x1} \frac{2.38 ABT}{Cb} + C_m x1 J0.453 + 0.4425 Cb -$$

$$0.2862 C_m + 0.3696 C_w - \frac{0.003467 x^2}{x^4} Hx^2 + 2. x4LN x5^2$$

$$H3.63637 + 0.434294 \text{Log} x1 x5DL^2 \wedge 0.2 \wedge 0.56 +$$

$$45187.7 + 2.26041 Hx1 x2 x3L^{0.166667} + 0.537397 x5 - \frac{Cm H90. - hal^{1.37565}}{k} 1.78933 \cdot 10^{10}$$

$$c^{73.78613} Cb \bar{a} \frac{0.0713525 x1^2 - 5.08183 c16 x1 x4 -}{x1 x4} \frac{24.3584 x2 x4 - 8.90612 x4 H Cb x1 x2 x4L^{0.333333} -}{x1}$$

$$1.41435 x1 x4 \left(\frac{ABT^{1.5}}{-hb + x^4 + ABT x^2 x^4} \right) \frac{x5}{x1} \frac{0.9 y}{k}$$

$$\begin{aligned}
& 0. \bar{a} \left\{ \frac{-13.3425 + 53.5923 C_p}{1} \right\} x1 \\
& \frac{J}{x2} \left\{ \frac{1.07961}{x4} H1. AT - 1.25 Cm x2 x4 \right\} + 135.73 AT c6 \\
& x5^2 + 135.73 \left\{ -0.00205 - 0.00109545 H - 0.04 + 1. c4L Cb^4 \right\} \\
& \bar{a} \left\{ \frac{-1.41435}{-hb \times x4 + ABT^1.5} \cdot \frac{ABT^1.5}{ABT^1.5 x2 x4} \right\} \cdot \frac{0.006}{x1} + \frac{0.006}{H100. + x1L^{0.16}} \\
& \frac{2.38 ABT}{Cb} + \frac{0.003467 x2}{x4} H x2 + 2. x4LN x5^2 + 569.292 ABT^{1.5} \bar{a} \left\{ \frac{-0.56632}{ABT^1.5} \right\} \\
& \left\{ -2.45175 ABT - 9.807 hb + 9.807 x4 + 0.0396911 x5^2 \right\} \\
& \left\{ 3.77918 + 1. \right\} \\
& \left\{ -2.45175 ABT - 9.807 hb + 9.807 x4 + 0.0396911 x5^2 \right\} \\
& \left\{ 10.1798 \right\} \left\{ 0.93 + \frac{0.487118 H1. + 0.011 CsternL}{H1. - CpL^{0.50247}} \right\} \\
& \left\{ 1. - Cp + \frac{0.121563}{-1.74. Cp} \right\} \left\{ \frac{1.06806}{x1} \right\} \left\{ \frac{0.36486}{Cb x2 x4} \right\} \\
& \frac{J}{x1} \left\{ \frac{0.46106}{x4} \right\} \frac{2.38 ABT}{Cb} + \frac{0.003467 x2}{x4} H x2 + 2. x4LN x5^2 \\
& 0.2862 Cm + 0.3696 Cw - \frac{0.003467 x2}{x4} H x2 + 2. x4LN x5^2 \\
& H3.63637 + 0.434294 Log x1 x5DL^2 \left\{ \frac{0.2}{x1} \right\}^{0.8} + \\
& 907.529 \left\{ x5 \right\} - \frac{1.78933}{Cm H90. - hal^{1.37565}} \cdot 10^{10} c7^{3.78613} Cb \bar{a}^{\wedge}
\end{aligned}$$

$$\begin{aligned}
& 0.0713525 x1^2 - 5.08183 c16 x1 x4 - 24.3584 x2 x4 - \\
& 8.90612 x4 \text{Hcb} x1 x2 x4^{0.333333} - 1.41435 x1 x4 \\
& \frac{ABT^{1.5}}{-hb + x4 + ABT x2 x4} x5^{0.9} + 0. \bar{a} \frac{-13.4853}{x1} \text{Cos}\beta \\
& \frac{-13.3425 + 53.5923 C_p}{x1} x1 J \frac{x4^{1.07961}}{x2} \text{H1. AT} - 1.25 C_m x2 x4 \\
& 135.73 \text{AT} c6 x5^2 + 135.73 \frac{-0.00205 - 0.00109545 \text{H} - 0.04 + 1. c4L}{k} \\
& C_b^4 \bar{a}^{-1.41435} \frac{ABT^{1.5}}{-hb+x4+ABT x2x4} \cdot \frac{0.006}{\text{H}100. + x1^{0.16}} \\
& \frac{2.38 ABT}{C_b} + C_m^4 x1 J 0.453 + 0.4425 C_b - 0.2862 C_m + 0.3696 C_w - \\
& \frac{0.003467 x2}{x4} \text{H}x2 + 2. x4 \text{LN} x5^2 + 569.292 ABT^{1.5} \bar{a} \frac{-0.56633}{-1.5 hb+x4} \\
& \frac{x5}{-2.45175 ABT - 9.807 hb + 9.807 x4 + 0.0396911 x5^2} \frac{V^3}{k} \\
& 3.77918 + 1. \frac{x5}{-2.45175 ABT - 9.807 hb + 9.807 x4 + 0.0396911 x5^2} \frac{V^2}{k} + \\
& 10.1798 \frac{0.93 + \frac{\text{H1.} - C_{pl}^{0.60247}}{k}}{k} 0.487118 \text{H1.} + 0.011 C_{sternL} \\
& \frac{1. - C_p + \frac{0.121563}{-1.74 C_p}}{k} J \frac{x2^{1.06806}}{x1} \\
& \frac{x1^2}{C_b x2 x4} \frac{0.36486}{x1} J \frac{x4^{0.46106}}{x1} J \frac{2.38 ABT}{C_b} + \\
& \cdot C_m^4 x1 J 0.453 + 0.4425 C_b - 0.2862 C_m + 0.3696 C_w - \frac{0.003467 x2}{x4} \\
& \text{H}x2 + 2. x4 \text{LN} x5^2 \frac{V}{k} \text{H}3.63637 + 0.434294 \text{Log}x1 x5 \text{DL}^2 \frac{V^2}{k}^{0.2} + \\
& 12.2614 \frac{x5}{k} - \frac{C_m \text{H}90. - \text{hal}^{1.37565}}{k} 1.78933 \cdot 10^{10} c7^{3.78613} C_b \bar{a}^{\wedge}
\end{aligned}$$

$$\begin{aligned}
& 0.0713525 x1^2 - 5.08183 c16 x1 x4 - 24.3584 x2 x4 - \\
& 8.90612 x4 HcB x1 x2 x4^{0.333333} - 1.41435 x1 x4 \\
& \frac{ABT^{1.5}}{-hb + x4 + ABT x2 x4} x5^{0.9} + 0. \bar{a} \cos\beta \\
& \frac{-13.3425 + 53.5923 Cp}{x1} x1 J \frac{x4^{1.07961}}{x2} H1. AT - 1.25 Cm x2 x4 \\
& 135.73 AT c6 x5^2 + 135.73 - 0.00205 - 0.00109545 H - 0.04 + 1. c4L \\
& Cb^4. \bar{a}^{-1.41435} \frac{ABT^{1.5}}{-hb+x4+ABT x2x4} \cdot \frac{0.006}{H100. + x1L^{0.16}} \\
& \frac{2.38 ABT}{Cb} + \frac{Cm}{x1} J 0.453 + 0.4425 Cb - 0.2862 Cm + 0.3696 Cw - \\
& \frac{0.003467 x2}{x4} Hx2 + 2. x4LN x5^2 + 569.292 ABT^{1.5} \bar{a} \\
& -2.45175 \frac{x5}{ABT} - 9.807 hb + 9.807 x4 + 0.0396911 x5^2 \\
& 3.77918 + 1. -2.45175 \frac{x5}{ABT} - 9.807 hb + 9.807 x4 + 0.0396911 x5^2 \\
& 10.1798 \cdot 0.93 + \frac{H1. - Cpl^{0.60247}}{x1} \cdot 0.487118 H1. + 0.011 Csternl \\
& \frac{1. - Cp + \frac{0.121563}{-1.74 \cdot Cp}}{x1} J \frac{x2^{1.06806}}{x1} \\
& \frac{x1^2}{Cb x2 x4} \cdot \frac{0.36486}{x1} J \frac{x4^{0.46106}}{x1} J \frac{2.38 ABT}{Cb} + \\
& \cdot \frac{Cm}{x1} J 0.453 + 0.4425 Cb - 0.2862 Cm + 0.3696 Cw - \frac{0.003467 x2}{x4} \\
& Hx2 + 2. x4LN x5^2 + H3.63637 + 0.434294 \text{Log}x1 x5DL^{2.6} + \\
& 16577.86 \cdot \frac{Cm}{x1} H19.1016 + 1. x1L x2 x5^3 \cdot M' HH748369. + H3754.34 - 2514.29 Cbl x5 + \\
& x1 H39178.3 + H268.651 + 1. Ntd x2 + H - 0.0359016 + 0.331601 Cbl x2 x3L x5LL \\
& H3.63637 + 0.434294 \text{Log}x1 x5DL^2 \cdot L - \\
& H4220.42 Cm^{3.2} x1 H19.1016 + 1. x1L x2 x5^3 \cdot L \cdot HH748369. + H3754.34 - 2514.29 Cbl x5 + \\
& x1 H39178.3 + H268.651 + 1. Ntd x2 + H - 0.0359016 + 0.331601 Cbl x2 x3L x5LL
\end{aligned}$$

$$\begin{aligned}
& H3.63637 + 0.434294 \operatorname{Log} x \cdot x^{50L^2} L + \\
& 15450.27 \cdot \frac{H19.1016}{Cm} Cw x^{19} + 1. x^{1L} x^2 x^{5^3} M' \\
& H748369. + H3754.34 - 2514.29 Cbl x^5 + \\
& x^{19} H39178.3 + H268.651 + 1. Ntd x^2 + H-0.0359016 + 0.331601 Cbl x^2 x^3 L x^{5LL} \\
& H3.63637 + 0.434294 \operatorname{Log} x \cdot x^{50L^2} L - \\
& 151.1257 \cdot \frac{H19.1016}{Cm} x^{19} + 1. x^{1L} x^2 x^{5^3} M' \\
& Hx4 H748369. + H3754.34 - 2514.29 Cbl x^5 + \\
& x^{19} H39178.3 + H268.651 + 1. Ntd x^2 + H-0.0359016 + 0.331601 Cbl x^2 x^3 L x^{5LL} \\
& H3.63637 + 0.434294 \operatorname{Log} x \cdot x^{50L^2} L + \\
& 113360.2 \cdot \frac{H19.1016}{Cm} x^{19} + 1. x^{1L} x^4 x^{5^3} M' \\
& H748369. + H3754.34 - 2514.29 Cbl x^5 + \\
& x^{19} H39178.3 + H268.651 + 1. Ntd x^2 + H-0.0359016 + 0.331601 Cbl x^2 x^3 L x^{5LL} \\
& H3.63637 + 0.434294 \operatorname{Log} x \cdot x^{50L^2} L - \\
& H8440.83 Cm^{3^2} x^{19} + 1. x^{1L} x^4 x^{5^3} L \cdot H748369. + H3754.34 - 2514.29 Cbl x^5 + \\
& x^{19} H39178.3 + H268.651 + 1. Ntd x^2 + H-0.0359016 + 0.331601 Cbl x^2 x^3 L x^{5LL} \\
& H3.63637 + 0.434294 \operatorname{Log} x \cdot x^{50L^2} L + \\
& 110900.5 \cdot \frac{H19.1016}{Cm} Cw x^{19} + 1. x^{1L} x^4 x^{5^3} M' \\
& H748369. + H3754.34 - 2514.29 Cbl x^5 + \\
& x^{19} H39178.3 + H268.651 + 1. Ntd x^2 + H-0.0359016 + 0.331601 Cbl x^2 x^3 L x^{5LL} \\
& H3.63637 + 0.434294 \operatorname{Log} x \cdot x^{50L^2} L + H105839. ABT H19.1016 + 1. x^{1L} x^{5^3} L \cdot \\
& HCb H2.25684 \cdot 10^6 + H11321.9 - 7582.29 Cbl x^5 + \\
& x^{19} H118149. + H810.165 + 3.01567 Ntd x^2 + H-0.108267 + 1. Cbl x^2 x^3 L x^{5LL} \\
& H3.63637 + 0.434294 \operatorname{Log} x \cdot x^{50L^2} L + \\
& 119678.1 Cb \cdot \frac{H19.1016}{Cm} x^{19} + 1. x^{1L} x^2 x^{5^3} M' \\
& H2.25684 \cdot 10^6 + H11321.9 - 7582.29 Cbl x^5 + \\
& x^{19} H118149. + H810.165 + 3.01567 Ntd x^2 + H-0.108267 + 1. Cbl x^2 x^3 L x^{5LL} \\
& H3.63637 + 0.434294 \operatorname{Log} x \cdot x^{50L^2} L + \\
& 139356.2 Cb \cdot \frac{H19.1016}{Cm} x^{19} + 1. x^{1L} x^4 x^{5^3} M' \\
& H2.25684 \cdot 10^6 + H11321.9 - 7582.29 Cbl x^5 + \\
& x^{19} H118149. + H810.165 + 3.01567 Ntd x^2 + H-0.108267 + 1. Cbl x^2 x^3 L x^{5LL} \\
& H3.63637 + 0.434294 \operatorname{Log} x \cdot x^{50L^2} L +
\end{aligned}$$

$$55436.8 ABT H19.1016 + 1. x^{1L} \left\{ \frac{1. - Cp + \dots}{-1.74. Cp} \right\}^{0.121563} \frac{J x^2}{x^1}^{1.06806}$$

$$\frac{J x^2}{x^1}^{1.06806} \frac{J x^4}{x^1}^{0.36486} \frac{J x^4}{x^1}^{0.46106} x^{5^3} M'$$

$$\begin{aligned}
& HCb H1. - Cpl^{0.60247} H2.25684 \cdot 10^6 + H11321.9 - 7582.29 Cbl x^5 + \\
& x^{19} H118149. + H810.165 + 3.01567 Ntd x^2 + H-0.108267 + 1. Cbl x^2 x^3 L x^{5LL} \\
& H3.63637 + 0.434294 \operatorname{Log} x \cdot x^{50L^2} L +
\end{aligned}$$

$$609.805 ABT Cstern H19.1016 + 1. x^{1L} \left\{ \frac{1. - Cp + \dots}{-1.74. Cp} \right\}^{0.121563}$$

$$\frac{J x^2}{x^1}^{1.06806} \frac{J x^4}{x^1}^{0.36486} \frac{J x^4}{x^1}^{0.46106} x^{5^3} M'$$

$$HCb H1. - Cpl^{0.60247} H2.25684 \cdot 10^6 + H11321.9 - 7582.29 Cbl x^5 +$$

$$x1 \text{H}118149. + \text{H}810.165 + 3.01567 \text{Ntd } x2 + \text{H} - 0.108267 + 1. \text{Cbl } x2 \text{ } x3L \text{ } x5LL$$

$$\text{H}3.63637 + 0.434294 \text{Log}x1 \text{ } x5DL^2L +$$

$$10390.1 \cdot \text{Cm} \cdot x1 \text{H}19.1016 + 1. \cdot x1L \cdot \left\{ \begin{array}{l} 1. - \text{Cp} + \\ -1. +4. \text{Cp} \end{array} \right\}^{0.121563} x2$$

$$x2 \text{J} \begin{array}{l} x2 \\ x1 \end{array} \begin{array}{l} 1.06806 \\ \text{J} \\ \text{N} \end{array} \text{J} \begin{array}{l} x1^2. \\ \text{C} \\ \text{b} \end{array} \begin{array}{l} 0.36486 \\ x2 \\ x4 \end{array} \left\{ \begin{array}{l} 0.46106 \\ \text{J} \\ \text{N} \end{array} \right\} x5^3 \cdot \cdot \cdot$$

$$\text{H}1. - \text{Cpl}^{0.60247} \text{H}2.25684 \cdot 10^6 + \text{H}11321.9 - 7582.29 \text{Cbl } x5 +$$

$$x1 \text{H}118149. + \text{H}810.165 + 3.01567 \text{Ntd } x2 + \text{H} - 0.108267 + 1. \text{Cbl } x2 \text{ } x3L \text{ } x5LL$$

$$\text{H}3.63637 + 0.434294 \text{Log}x1 \text{ } x5DL^2L +$$

$$10307.1 \text{Cb} \cdot \text{Cm} \cdot x1 \text{H}19.1016 + 1. \cdot x1L \cdot \left\{ \begin{array}{l} 1. - \text{Cp} + \\ -1. +4. \text{Cp} \end{array} \right\}^{0.121563} x2$$

$$x2 \text{J} \begin{array}{l} x2 \\ x1 \end{array} \begin{array}{l} 1.06806 \\ \text{J} \\ \text{N} \end{array} \text{J} \begin{array}{l} x1^2. \\ \text{C} \\ \text{b} \end{array} \begin{array}{l} 0.36486 \\ x2 \\ x4 \end{array} \left\{ \begin{array}{l} 0.46106 \\ \text{J} \\ \text{N} \end{array} \right\} x5^3 \cdot \cdot \cdot$$

$$\text{H}1. - \text{Cpl}^{0.60247} \text{H}2.25684 \cdot 10^6 + \text{H}11321.9 - 7582.29 \text{Cbl } x5 +$$

$$x1 \text{H}118149. + \text{H}810.165 + 3.01567 \text{Ntd } x2 + \text{H} - 0.108267 + 1. \text{Cbl } x2 \text{ } x3L \text{ } x5LL$$

$$\text{H}3.63637 + 0.434294 \text{Log}x1 \text{ } x5DL^2L -$$

$$6666.39 \text{Cm}^{3 \cdot 2} x1 \text{H}19.1016 + 1. \cdot x1L \cdot \left\{ \begin{array}{l} 1. - \text{Cp} + \\ -1. +4. \text{Cp} \end{array} \right\}^{0.121563} x2$$

$$x2 \text{J} \begin{array}{l} x2 \\ x1 \end{array} \begin{array}{l} 1.06806 \\ \text{J} \\ \text{N} \end{array} \text{J} \begin{array}{l} x1^2. \\ \text{C} \\ \text{b} \end{array} \begin{array}{l} 0.36486 \\ x2 \\ x4 \end{array} \left\{ \begin{array}{l} 0.46106 \\ \text{J} \\ \text{N} \end{array} \right\} x5^3 \cdot \cdot \cdot$$

$$\text{H}1. - \text{Cpl}^{0.60247} \text{H}2.25684 \cdot 10^6 + \text{H}11321.9 - 7582.29 \text{Cbl } x5 +$$

$$x1 \text{H}118149. + \text{H}810.165 + 3.01567 \text{Ntd } x2 + \text{H} - 0.108267 + 1. \text{Cbl } x2 \text{ } x3L \text{ } x5LL$$

$$\text{H}3.63637 + 0.434294 \text{Log}x1 \text{ } x5DL^2L +$$

$$114.291 \cdot \text{Cm} \cdot \text{Cstern} x1 \text{H}19.1016 + 1. \cdot x1L \cdot \left\{ \begin{array}{l} 1. - \text{Cp} + \\ -1. +4. \text{Cp} \end{array} \right\}^{0.121563} x2$$

$$x2 \text{J} \begin{array}{l} x2 \\ x1 \end{array} \begin{array}{l} 1.06806 \\ \text{J} \\ \text{N} \end{array} \text{J} \begin{array}{l} x1^2. \\ \text{C} \\ \text{b} \end{array} \begin{array}{l} 0.36486 \\ x2 \\ x4 \end{array} \left\{ \begin{array}{l} 0.46106 \\ \text{J} \\ \text{N} \end{array} \right\} x5^3 \cdot \cdot \cdot$$

$$\text{H}1. - \text{Cpl}^{0.60247} \text{H}2.25684 \cdot 10^6 + \text{H}11321.9 - 7582.29 \text{Cbl } x5 +$$

$$x1 \text{H}118149. + \text{H}810.165 + 3.01567 \text{Ntd } x2 + \text{H} - 0.108267 + 1. \text{Cbl } x2 \text{ } x3L \text{ } x5LL$$

$$\text{H}3.63637 + 0.434294 \text{Log}x1 \text{ } x5DL^2L +$$

$$113.378 \text{Cb} \cdot \text{Cm} \cdot \text{Cstern} x1 \text{H}19.1016 + 1. \cdot x1L \cdot \left\{ \begin{array}{l} 1. - \text{Cp} + \\ -1. +4. \text{Cp} \end{array} \right\}^{0.121563} x2$$

$$x2 \text{J} \begin{array}{l} x2 \\ x1 \end{array} \begin{array}{l} 1.06806 \\ \text{J} \\ \text{N} \end{array} \text{J} \begin{array}{l} x1^2. \\ \text{C} \\ \text{b} \end{array} \begin{array}{l} 0.36486 \\ x2 \\ x4 \end{array} \left\{ \begin{array}{l} 0.46106 \\ \text{J} \\ \text{N} \end{array} \right\} x5^3 \cdot \cdot \cdot$$

$$\text{H}1. - \text{Cpl}^{0.60247} \text{H}2.25684 \cdot 10^6 + \text{H}11321.9 - 7582.29 \text{Cbl } x5 +$$

$$x1 \text{H}118149. + \text{H}810.165 + 3.01567 \text{Ntd } x2 + \text{H} - 0.108267 + 1. \text{Cbl } x2 \text{ } x3L \text{ } x5LL$$

$$\text{H}3.63637 + 0.434294 \text{Log}x1 \text{ } x5DL^2L -$$

$$73.3303 \text{ Cm}^{3 \cdot 2} \text{ Cstern x1 H19.1016} + 1. \text{ x1L} \left\{ \begin{array}{l} 1. - \text{ Cp} + \\ -1. + 4. \text{ Cp} \end{array} \right\}^{0.121563}$$

$$x2 \text{ J} \left\{ \begin{array}{l} x^2 \\ x1 \end{array} \right\}^{1.06806} \text{ J} \left\{ \begin{array}{l} x1^2 \\ \text{Cb x2 x4} \end{array} \right\}^{0.36486} \text{ J} \left\{ \begin{array}{l} x4 \\ x1 \end{array} \right\}^{0.46106} x5^3 \text{ "}$$

$$\text{H1.} - \text{Cpl}^{0.60247} \text{H2.25684} \cdot 10^6 + \text{H11321.9} - 7582.29 \text{ Cbl x5} + \\ x1 \text{ H118149.} + \text{H810.165} + 3.01567 \text{ Ntd x2} + \text{H} - 0.108267 + 1. \text{ Cbl x2 x3L x5LL} \\ \text{H3.63637} + 0.434294 \text{ Log@x1 x5DL}^2 \text{L} +$$

$$8609.01 \cdot \text{Cm} \text{ Cw x1 H19.1016} + 1. \text{ x1L} \left\{ \begin{array}{l} 1. - \text{ Cp} + \\ -1. + 4. \text{ Cp} \end{array} \right\}^{0.121563}$$

$$x2 \text{ J} \left\{ \begin{array}{l} x^2 \\ x1 \end{array} \right\}^{1.06806} \text{ J} \left\{ \begin{array}{l} x1^2 \\ \text{Cb x2 x4} \end{array} \right\}^{0.36486} \text{ J} \left\{ \begin{array}{l} x4 \\ x1 \end{array} \right\}^{0.46106} x5^3 \text{ "}$$

$$\text{H1.} - \text{Cpl}^{0.60247} \text{H2.25684} \cdot 10^6 + \text{H11321.9} - 7582.29 \text{ Cbl x5} + \\ x1 \text{ H118149.} + \text{H810.165} + 3.01567 \text{ Ntd x2} + \text{H} - 0.108267 + 1. \text{ Cbl x2 x3L x5LL} \\ \text{H3.63637} + 0.434294 \text{ Log@x1 x5DL}^2 \text{L} +$$

$$94.6991 \cdot \text{Cm} \text{ Cstern Cw x1 H19.1016} + 1. \text{ x1L} \left\{ \begin{array}{l} 1. - \text{ Cp} + \\ -1. + 4. \text{ Cp} \end{array} \right\}^{0.121563}$$

$$x2 \text{ J} \left\{ \begin{array}{l} x^2 \\ x1 \end{array} \right\}^{1.06806} \text{ J} \left\{ \begin{array}{l} x1^2 \\ \text{Cb x2 x4} \end{array} \right\}^{0.36486} \text{ J} \left\{ \begin{array}{l} x4 \\ x1 \end{array} \right\}^{0.46106} x5^3 \text{ "}$$

$$\text{H1.} - \text{Cpl}^{0.60247} \text{H2.25684} \cdot 10^6 + \text{H11321.9} - 7582.29 \text{ Cbl x5} + \\ x1 \text{ H118149.} + \text{H810.165} + 3.01567 \text{ Ntd x2} + \text{H} - 0.108267 + 1. \text{ Cbl x2 x3L x5LL} \\ \text{H3.63637} + 0.434294 \text{ Log@x1 x5DL}^2 \text{L} -$$

$$80.7561 \cdot \text{Cm} \text{ H19.1016} + 1. \text{ x1L} \left\{ \begin{array}{l} 1. - \text{ Cp} + \\ -1. + 4. \text{ Cp} \end{array} \right\}^{0.121563} x2^3$$

$$\text{J} \left\{ \begin{array}{l} x^2 \\ x1 \end{array} \right\}^{0.06806} \text{ J} \left\{ \begin{array}{l} x1^2 \\ \text{Cb x2 x4} \end{array} \right\}^{0.36486} \text{ J} \left\{ \begin{array}{l} x4 \\ x1 \end{array} \right\}^{0.46106} x5^3 \text{ "}$$

$$\text{H1.} - \text{Cpl}^{0.60247} x4 \text{H2.25684} \cdot 10^6 + \text{H11321.9} - 7582.29 \text{ Cbl x5} + \\ x1 \text{ H118149.} + \text{H810.165} + 3.01567 \text{ Ntd x2} + \text{H} - 0.108267 + 1. \text{ Cbl x2 x3L x5LL} \\ \text{H3.63637} + 0.434294 \text{ Log@x1 x5DL}^2 \text{L} -$$

$$0.888317 \cdot \text{Cm} \text{ Cstern H19.1016} + 1. \text{ x1L} \left\{ \begin{array}{l} 1. - \text{ Cp} + \\ -1. + 4. \text{ Cp} \end{array} \right\}^{0.121563}$$

$$x2^3 \text{ J} \left\{ \begin{array}{l} x^2 \\ x1 \end{array} \right\}^{0.06806} \text{ J} \left\{ \begin{array}{l} x1^2 \\ \text{Cb x2 x4} \end{array} \right\}^{0.36486} \text{ J} \left\{ \begin{array}{l} x4 \\ x1 \end{array} \right\}^{0.46106} x5^3 \text{ "}$$

$$\text{H1.} - \text{Cpl}^{0.60247} x4 \text{H2.25684} \cdot 10^6 + \text{H11321.9} - 7582.29 \text{ Cbl x5} + \\ x1 \text{ H118149.} + \text{H810.165} + 3.01567 \text{ Ntd x2} + \text{H} - 0.108267 + 1. \text{ Cbl x2 x3L x5LL} \\ \text{H3.63637} + 0.434294 \text{ Log@x1 x5DL}^2 \text{L} +$$

$$21103.3 \cdot \text{Cm} \text{ x1 H19.1016} + 1. \text{ x1L} \left\{ \begin{array}{l} 1. - \text{ Cp} + \\ -1. + 4. \text{ Cp} \end{array} \right\}^{0.121563}$$

$$\begin{aligned} &H1. - Cpl^{0.60247} H2.25684 \cdot 10^6 + H11321.9 - 7582.29 Cbl x5 + \\ &x1 H118149. + H810.165 + 3.01567 Ntd x2 + H-0.108267 + 1. Cbl x2 x3L x5LL \\ &H3.63637 + 0.434294 \text{Log}x1 x5DL^2L + \end{aligned}$$

$$\begin{aligned} &17218. \cdot \text{Cm} Cw x1 H19.1016 + 1. x1L \left\{ \begin{array}{l} 1. - Cp + \\ -1.+4. Cp \end{array} \right\}^{0.121563} \\ &J \left\{ \begin{array}{l} x2 \\ x1 \end{array} \right\}^{1.06806} \cdot J \left\{ \begin{array}{l} x1. \\ k Cb x2 x4 \end{array} \right\}^{0.36486} \cdot x4 J \left\{ \begin{array}{l} x4 \\ x1 \end{array} \right\}^{0.46106} \cdot x5^3 \cdot \end{aligned}$$

$$\begin{aligned} &H1. - Cpl^{0.60247} H2.25684 \cdot 10^6 + H11321.9 - 7582.29 Cbl x5 + \\ &x1 H118149. + H810.165 + 3.01567 Ntd x2 + H-0.108267 + 1. Cbl x2 x3L x5LL \\ &H3.63637 + 0.434294 \text{Log}x1 x5DL^2L + \end{aligned}$$

$$\begin{aligned} &189.398 \cdot \text{Cm} Cstern Cw x1 H19.1016 + 1. x1L \left\{ \begin{array}{l} 1. - Cp + \\ -1.+4. Cp \end{array} \right\}^{0.121563} \\ &J \left\{ \begin{array}{l} x2 \\ x1 \end{array} \right\}^{1.06806} \cdot J \left\{ \begin{array}{l} x1. \\ k Cb x2 x4 \end{array} \right\}^{0.36486} \cdot x4 J \left\{ \begin{array}{l} x4 \\ x1 \end{array} \right\}^{0.46106} \cdot x5^3 \cdot \end{aligned}$$

$$\begin{aligned} &H1. - Cpl^{0.60247} H2.25684 \cdot 10^6 + H11321.9 - 7582.29 Cbl x5 + \\ &x1 H118149. + H810.165 + 3.01567 Ntd x2 + H-0.108267 + 1. Cbl x2 x3L x5LL \end{aligned}$$

$$H3.63637 + 0.434294 \text{Log}x1 x5DL^2L \cdot \left\{ \begin{array}{l} x \\ x \\ x \\ x \end{array} \right\} \cdot \left\{ \begin{array}{l} x \\ x \end{array} \right\}$$

$$\begin{aligned} &H- 828.33 + 0.601404 Ntd x1 x2 - 0.0215914 \\ &x1 \\ &x2 \\ &x3 + \\ &Cb \\ &H- 1512.11 + \\ &0.199426 x1 x2 x3LL \end{aligned}$$

Appendix B

Mathematical Form of the Displacement Weight Equality Constraint

$$WT - Displ = 0$$

where

$$WT - Displ =$$

$$40896.14657063999 - 1512.1065349199998 Cb + 0.6383652303382383 Hx1 x2 x3L^{0.724} + 0.058766414854051534 Hx1 x2 x3L^{1.003} + 0.029108180605508804 Cb Hx1 x2 x3L^{1.003} + 0.00005453523298455982 J - 8.3 + \frac{x1^{1.691}}{x3} Hx1 x2 x3L^{1.003} + 0.000027012391601912168$$

$$Cb J - 8.3 + \frac{x1^{1.691}}{x3} Hx1 x2 x3L^{1.003} + 0.0562114015963442 AT c6 x5^{2.} -$$

$$\frac{0.00027425542838856333 ABT x5^{2.}}{Cb} + \frac{0.0008026988147957951 ABT x5^{2.}}{Cb H100. + x1L^{0.16}} +$$

$$\cdot \frac{5.862083303284248 \cdot 10^{-6} ABT Cb^3 \cdot \bar{a}}{x1} - \frac{1.41434649220055 \cdot 10^{-5} \cdot \frac{ABT^5}{-hb+x4+ ABT^2 x4}}{x5^{2.}} -$$

$$0.0001465520825821062 ABT c4 Cb^3 \cdot \bar{a} - \frac{1.41434649220055 \cdot 10^{-5} \cdot \frac{ABT^5}{-hb+x4+ ABT^2 x4}}{x5^{2.}} +$$

$$\frac{0.23576661625228706 ABT^{1.5} \bar{a}}{x1} - \frac{0.5662265306122141 \cdot \frac{ABT^5}{-1.5 \cdot hb+x4}}{x5^{2.}}$$

$$\frac{-2.45175 ABT - 9.807 hb + 9.807 x4 + 0.03969110399999999 x5^2}{x1} +$$

$$3. \cdot \frac{13.779184373405185}{x1} +$$

$$1. \cdot \frac{1x5' |' | - 2.45175 \cdot \frac{ABT - 9.807 hb + 9.807 x4 + 0.03969110399999999 x5^2}{x1}}{x1} +$$

$$x1^{3 \cdot 2} \frac{x2^2}{x4} - 8.539429753145583 \cdot 10^{-9} Cb^4 \cdot \frac{Cm \bar{a}}{x1} - \frac{1.41434649220055 \cdot 10^{-5} \cdot \frac{ABT^5}{-hb+x4+ ABT^2 x4}}{x5^{2.}} +$$

$$2.1348574382863958 \cdot 10^{-7} c4 Cb^4 \cdot \frac{Cm \bar{a}}{x1} - \frac{1.41434649220055 \cdot 10^{-5} \cdot \frac{ABT^5}{-hb+x4+ ABT^2 x4}}{x5^{2.}} +$$

$$x4 \frac{2.2315325515863566 \cdot 10^{-6} Cb^4 \cdot \frac{Cm \bar{a}}{x1}}{x1} - \frac{1.41434649220055 \cdot 10^{-5} \cdot \frac{ABT^5}{-hb+x4+ ABT^2 x4}}{x5^{2.}} -$$

$$\begin{aligned}
& 0.00005578831378965892^{\cdot} c4 Cb^{4^{\cdot}} \cdot \frac{\text{ABT}^{1.5}}{-hb+x4+ \text{ABT}^2 x4} x5^{2^{\cdot}} + \\
& 2.1798082871456134^{\cdot} *^{\wedge}-6 Cb^{5^{\cdot}} \cdot \frac{\text{ABT}^{1.5}}{-hb+x4+ \text{ABT}^2 x4} x5^{2^{\cdot}} - \\
& 0.000054495207178640325^{\cdot} c4 Cb^{5^{\cdot}} \cdot \frac{\text{ABT}^{1.5}}{-hb+x4+ \text{ABT}^2 x4} x5^{2^{\cdot}} - \\
& 1.4098556650419765^{\cdot} *^{\wedge}-6 Cb^{4^{\cdot}} C m^{3^{\cdot}2} \bar{a} \cdot \frac{\text{ABT}^{1.5}}{-hb+x4+ \text{ABT}^2 x4} x5^{2^{\cdot}} + \\
& 0.00003524639162604941^{\cdot} c4 Cb^{4^{\cdot}} C m^{3^{\cdot}2} \bar{a} \cdot \frac{\text{ABT}^{1.5}}{-hb+x4+ \text{ABT}^2 x4} x5^{2^{\cdot}} + \\
& 1.8206941083141666^{\cdot} *^{\wedge}-6 Cb^{4^{\cdot}} \cdot \frac{\text{ABT}^{1.5}}{-hb+x4+ \text{ABT}^2 x4} x5^{2^{\cdot}} - \\
& 0.00004551735270785416^{\cdot} c4 Cb^{4^{\cdot}} \cdot \frac{\text{ABT}^{1.5}}{-hb+x4+ \text{ABT}^2 x4} x5^{2^{\cdot}} + \\
& x2 \left| \begin{array}{l} 1.0986874162868874^{\cdot} *^{\wedge}-6 Cb^{4^{\cdot}} \cdot \frac{\text{ABT}^{1.5}}{-hb+x4+ \text{ABT}^2 x4} x5^{2^{\cdot}} - \\ 0.00002746718540717218^{\cdot} c4 Cb^{4^{\cdot}} \cdot \frac{\text{ABT}^{1.5}}{-hb+x4+ \text{ABT}^2 x4} x5^{2^{\cdot}} + \\ 1.0899041435728067^{\cdot} *^{\wedge}-6 Cb^{5^{\cdot}} \cdot \frac{\text{ABT}^{1.5}}{-hb+x4+ \text{ABT}^2 x4} x5^{2^{\cdot}} - \\ 0.000027247603589320162^{\cdot} c4 Cb^{5^{\cdot}} \cdot \frac{\text{ABT}^{1.5}}{-hb+x4+ \text{ABT}^2 x4} x5^{2^{\cdot}} - \\ 7.049278325209882^{\cdot} *^{\wedge}-7 Cb^{4^{\cdot}} C m^{3^{\cdot}2} \bar{a} \cdot \frac{\text{ABT}^{1.5}}{-hb+x4+ \text{ABT}^2 x4} x5^{2^{\cdot}} + \\ 0.000017623195813024704^{\cdot} c4 Cb^{4^{\cdot}} C m^{3^{\cdot}2} \bar{a} \cdot \frac{\text{ABT}^{1.5}}{-hb+x4+ \text{ABT}^2 x4} x5^{2^{\cdot}} + \\ 9.103470541570833^{\cdot} *^{\wedge}-7 Cb^{4^{\cdot}} \cdot \frac{\text{ABT}^{1.5}}{-hb+x4+ \text{ABT}^2 x4} x5^{2^{\cdot}} - \\ 0.00002275867635392708^{\cdot} c4 Cb^{4^{\cdot}} \cdot \frac{\text{ABT}^{1.5}}{-hb+x4+ \text{ABT}^2 x4} x5^{2^{\cdot}} + \end{array} \right.
\end{aligned}$$

$$x1 \left| \begin{array}{l} \frac{7.4103484154325^{\cdot} *^{\wedge}6 AT c7^{3.78613^{\cdot}} Cb}{C m H90^{\cdot} - hal^{1.37565}} \end{array} \right.$$

$$\bar{a}^{\wedge} - 1.41434649220055^{\cdot} \& \frac{\text{ABT}^{1.5}}{-hb+x4+ \text{ABT}^2 x4} +$$

$$\frac{5.081833302662383^{\cdot}}{x1} - c16 - \frac{4.79323^{\cdot} x2}{x1} + \frac{0.0140407^{\cdot} x1}{x4} -$$

$$\frac{1.75254^{\cdot} Cb x2 x4}{HCb x1 x2 x4} + 0. \bar{a} \frac{-42.953161110595605^{\cdot}}{x1}$$

$$\begin{aligned}
& \text{CosB} \frac{-13.34248601399447 + 53.59231882287779 \cdot \text{Cp}}{\sqrt{x1}} \sqrt{x2}^{1.07961} + \\
& \sqrt{x4} \sqrt{x2} \sqrt{3.9951410513577697 \cdot \text{Cm} x5^2 - \frac{1.1693095760071521 \cdot \text{Cm} x5^2}{\text{H100} + x1L^{0.16}}} - \\
& \frac{0.000013593223821083144 \cdot \text{Cm} x5^2}{\text{H3.6363748627922092} + 0.43429448190325176 \text{ Log} x1 x5DL^2} - \\
& \sqrt{7.119896775568149 \cdot \text{Cm}} \sqrt{1 - \text{Cp} + \frac{0.121563}{-1. + 4. \text{Cp}}}^{0.121563} \\
& \sqrt{\frac{x2}{x1} 1.06806} \sqrt{\frac{x1^2}{\text{Cb} x2 x4} 0.36486} \sqrt{\frac{x4}{x1} 0.46106} \sqrt{x5^2} \text{ " } \\
& \text{HH1} - \text{Cpl}^{0.60247} \text{H3.6363748627922092} + 0.43429448190325176 \text{ Log} x1 x5DL^2 \text{ L} - \\
& \sqrt{7.831886453124964 \cdot \text{Cm} \text{Cstern}} \sqrt{1 - \text{Cp} + \frac{0.121563}{-1. + 4. \text{Cp}}}^{0.121563} \\
& \sqrt{\frac{x2}{x1} 1.06806} \sqrt{\frac{x1^2}{\text{Cb} x2 x4} 0.36486} \sqrt{\frac{x4}{x1} 0.46106} \sqrt{x5^2} \text{ " } \text{HH1} - \text{Cpl}^{0.60247} \\
& \text{H3.6363748627922092} + 0.43429448190325176 \text{ Log} x1 x5DL^2 \text{ L} + \\
& \sqrt{x2} \sqrt{0.601404 \text{ Ntd} + \text{H} - 0.02159136 + 0.19942607999999998 \text{ Cbl} x3 +} \\
& \sqrt{x4} \sqrt{-\text{Cb} + \frac{1}{\text{H90} - \text{hal}^{1.37563}}} \sqrt{9.262935519290624 \cdot \text{c}^7 3.78613} \sqrt{\text{Cb}} \\
& \sqrt{\bar{a}} \sqrt{-1.41434649220055 \cdot \& \frac{\text{ABT}^{1.5}}{-\text{hb} + x4 + \frac{\text{ABT}}{x2 x4}} + \frac{1}{\sqrt{x1}^{1.9}}} \\
& \sqrt{5.081833302662383} \sqrt{-c16 - \frac{4.79323 \cdot x2}{x1} + \frac{0.0140407 \cdot x1}{x4}} - \\
& \frac{1.75254 \cdot \text{Cb} x2 x4}{\text{HCb} x1 x2 x4L^{0.6666666666666667}} \sqrt{\frac{\text{W}}{\text{Z}}} + 0 \cdot \bar{a} \sqrt{\frac{-0.2952161110595605}{x1}} \\
& \text{CosB} \frac{-13.34248601399447 + 53.59231882287779 \cdot \text{Cp}}{\sqrt{x1}} \sqrt{x2}^{1.07961} \\
& \sqrt{\frac{x4}{x2} 1.07961} \sqrt{-0.00005140168988217349 \cdot \text{Cm} x5^2} -
\end{aligned}$$

$$\begin{aligned}
& 0.00005099076767308373 \cdot C_b \cdot C_m^{3/2} x^{5/2} + 0.00003297979143059111 \cdot C_m^{3/2} x^{5/2} - \\
& 0.00004259025476151807 \cdot C_m^{3/2} C_w x^{5/2} + \frac{0.00015044397038684924 \cdot C_m^{3/2} x^{5/2}}{H_{100} + x^{1.16}} + \\
& \frac{0.00014924127123829383 \cdot C_b \cdot C_m^{3/2} x^{5/2}}{H_{100} + x^{1.16}} - \\
& \frac{0.00009652621882124226 \cdot C_m^{3/2} x^{5/2}}{H_{100} + x^{1.16}} + \frac{0.0001246544041800529 \cdot C_m^{3/2} C_w x^{5/2}}{H_{100} + x^{1.16}} + \\
& \frac{0.0017489111557471224 \cdot C_m^{3/2} x^{5/2}}{H_{3.6363748627922092} + 0.43429448190325176 \cdot \text{Log} @ x^{1.5} D^{2.2}} + \\
& \frac{0.0017349297781451662 \cdot C_b \cdot C_m^{3/2} x^{5/2}}{H_{3.6363748627922092} + 0.43429448190325176 \cdot \text{Log} @ x^{1.5} D^{2.2}} - \\
& \frac{0.0011221172937969414 \cdot C_m^{3/2} x^{5/2}}{H_{3.6363748627922092} + 0.43429448190325176 \cdot \text{Log} @ x^{1.5} D^{2.2}} + \\
& \frac{0.0014491074485931147 \cdot C_m^{3/2} C_w x^{5/2}}{H_{3.6363748627922092} + 0.43429448190325176 \cdot \text{Log} @ x^{1.5} D^{2.2}} + \\
& \frac{0.0009160495745862653 \cdot C_m^{3/2} \left(1 - C_p + \frac{C_p}{-1 + 4 \cdot C_p} \right)^{0.121563}}{H_{1.5} - C_{pl}^{0.60247} H_{3.6363748627922092} + 0.43429448190325176 \cdot \text{Log} @ x^{1.5} D^{2.2} L +} \\
& \frac{J_{x^2/x^1}^{1.06806} \cdot J_{x^2/x^1}^{0.36486} \cdot J_{x^4/x^1}^{0.46106} \cdot x^{5/2}}{k \cdot C_b x^2 x^4} \\
& \frac{0.0009087263695381903 \cdot C_b \cdot C_m^{3/2} \left(1 - C_p + \frac{C_p}{-1 + 4 \cdot C_p} \right)^{0.121563}}{H_{1.5} - C_{pl}^{0.60247} H_{3.6363748627922092} + 0.43429448190325176 \cdot \text{Log} @ x^{1.5} D^{2.2} L -} \\
& \frac{J_{x^2/x^1}^{1.06806} \cdot J_{x^2/x^1}^{0.36486} \cdot J_{x^4/x^1}^{0.46106} \cdot x^{5/2}}{k \cdot C_b x^2 x^4} \\
& \frac{0.0005877457332470735 \cdot C_m^{3/2} \left(1 - C_p + \frac{C_p}{-1 + 4 \cdot C_p} \right)^{0.121563}}{H_{1.5} - C_{pl}^{0.60247} H_{3.6363748627922092} + 0.43429448190325176 \cdot \text{Log} @ x^{1.5} D^{2.2} L +} \\
& \frac{J_{x^2/x^1}^{1.06806} \cdot J_{x^2/x^1}^{0.36486} \cdot J_{x^4/x^1}^{0.46106} \cdot x^{5/2}}{k \cdot C_b x^2 x^4} \\
& \frac{0.000010076545320448919 \cdot C_m^{3/2} C_{stern} \left(1 - C_p + \frac{C_p}{-1 + 4 \cdot C_p} \right)^{0.121563}}{H_{1.5} - C_{pl}^{0.60247} H_{3.6363748627922092} + 0.43429448190325176 \cdot \text{Log} @ x^{1.5} D^{2.2} L +} \\
& \frac{J_{x^2/x^1}^{1.06806} \cdot J_{x^2/x^1}^{0.36486} \cdot J_{x^4/x^1}^{0.46106} \cdot x^{5/2}}{k \cdot C_b x^2 x^4}
\end{aligned}$$

$$\begin{aligned}
& \left[9.995990064920093 \cdot 10^{-6} C_b \cdot C_m C_{stern} \int_0^1 \frac{1}{1 - C_p + \frac{C_p}{-1 + 4 \cdot C_p}} \right. \\
& \quad \left. \int_0^1 \frac{x^2}{x^1} \int_0^1 \frac{x^{1.2}}{C_b x^2 x^4} \int_0^1 \frac{x^4}{x^1} x^{5.2} \right]^{0.121563} \\
& \quad \left[H_1 - C_{pl}^{0.60247} H_3.6363748627922092 + 0.43429448190325176 \log_{10} x \cdot x^{50L^2} \right] L - \\
& \left[6.4652030657178096 \cdot 10^{-6} C_m^{3.2} C_{stern} \int_0^1 \frac{1}{1 - C_p + \frac{C_p}{-1 + 4 \cdot C_p}} \right. \\
& \quad \left. \int_0^1 \frac{x^2}{x^1} \int_0^1 \frac{x^{1.2}}{C_b x^2 x^4} \int_0^1 \frac{x^4}{x^1} x^{5.2} \right]^{0.121563} \\
& \quad \left[H_1 - C_{pl}^{0.60247} H_3.6363748627922092 + 0.43429448190325176 \log_{10} x \cdot x^{50L^2} \right] L + \\
& \left[0.0007590175506922375 \cdot C_m C_w \int_0^1 \frac{1}{1 - C_p + \frac{C_p}{-1 + 4 \cdot C_p}} \right. \\
& \quad \left. \int_0^1 \frac{x^2}{x^1} \int_0^1 \frac{x^{1.2}}{C_b x^2 x^4} \int_0^1 \frac{x^4}{x^1} x^{5.2} \right]^{0.121563} \\
& \quad \left[H_1 - C_{pl}^{0.60247} H_3.6363748627922092 + 0.43429448190325176 \log_{10} x \cdot x^{50L^2} \right] L + \\
& \left[8.349193057614612 \cdot 10^{-6} \cdot C_m C_{stern} C_w \int_0^1 \frac{1}{1 - C_p + \frac{C_p}{-1 + 4 \cdot C_p}} \right. \\
& \quad \left. \int_0^1 \frac{x^2}{x^1} \int_0^1 \frac{x^{1.2}}{C_b x^2 x^4} \int_0^1 \frac{x^4}{x^1} x^{5.2} \right]^{0.121563} \\
& \quad \left[H_1 - C_{pl}^{0.60247} H_3.6363748627922092 + 0.43429448190325176 \log_{10} x \cdot x^{50L^2} \right] L + \\
& \quad \left[-0.00010440143618489008 \cdot C_m x^{5.2} - 0.00010198153534616746 \cdot C_b \cdot C_m x^{5.2} + \right. \\
& \quad \left. 0.00006595958286118222 \cdot C_m^{3.2} x^{5.2} - 0.00008518050952303614 \cdot C_m C_w x^{5.2} + \right. \\
& \quad \left. \frac{0.00030556517907772703 \cdot C_m x^{5.2}}{H_{100} + x^{1L^{0.16}}} + \frac{0.00029848254247658766 \cdot C_b \cdot C_m x^{5.2}}{H_{100} + x^{1L^{0.16}}} - \right. \\
& \quad \left. \frac{0.00019305243764248452 \cdot C_m^{3.2} x^{5.2}}{H_{100} + x^{1L^{0.16}}} + \frac{0.0002493088083601058 \cdot C_m C_w x^{5.2}}{H_{100} + x^{1L^{0.16}}} + \right. \\
& \quad \left. \frac{0.003552195206778577 \cdot C_m x^{5.2}}{H_3.6363748627922092 + 0.43429448190325176 \log_{10} x \cdot x^{50L^2}} + \right. \\
& \quad \left. \frac{0.0034698595562903324 \cdot C_b \cdot C_m x^{5.2}}{H_3.6363748627922092 + 0.43429448190325176 \log_{10} x \cdot x^{50L^2}} - \right. \\
& \quad \left. \frac{0.0022442345875938827 \cdot C_m^{3.2} x^{5.2}}{H_3.6363748627922092 + 0.43429448190325176 \log_{10} x \cdot x^{50L^2}} + \right.
\end{aligned}$$

$$\begin{aligned}
& 0.0028982148971862295 \cdot \text{Cm} \text{Cw} x5^2 \cdot \\
& \#3.6363748627922092 \cdot + 0.43429448190325176 \cdot \text{Log} x1 x50L^2 \cdot + \\
& 0.0018605787362748032 \cdot \text{Cm} \left\{ \begin{array}{l} 1. - Cp + \\ -1. +4. Cp \end{array} \right\}^{0.121563} \\
& \left\{ \begin{array}{l} x^2 \\ x1 \end{array} \right\}^{1.06806} \left\{ \begin{array}{l} x^2 \\ Cb x2 x4 \end{array} \right\}^{0.36486} \left\{ \begin{array}{l} x^4 \\ x1 \end{array} \right\}^{0.46106} x5^2 \cdot \mu \\
& \#H1. - Cpl^{0.60247} \#3.6363748627922092 \cdot + 0.43429448190325176 \cdot \text{Log} x1 x50L^2 \cdot L + \\
& 0.0018174527390763806 \cdot Cb \cdot \text{Cm} \left\{ \begin{array}{l} 1. - Cp + \\ -1. +4. Cp \end{array} \right\}^{0.121563} \\
& \left\{ \begin{array}{l} x^2 \\ x1 \end{array} \right\}^{1.06806} \left\{ \begin{array}{l} x^2 \\ Cb x2 x4 \end{array} \right\}^{0.36486} \left\{ \begin{array}{l} x^4 \\ x1 \end{array} \right\}^{0.46106} x5^2 \cdot \mu \\
& \#H1. - Cpl^{0.60247} \#3.6363748627922092 \cdot + 0.43429448190325176 \cdot \text{Log} x1 x50L^2 \cdot L - \\
& 0.001175491466494147 \cdot \text{Cm}^{3+2} \left\{ \begin{array}{l} 1. - Cp + \\ -1. +4. Cp \end{array} \right\}^{0.121563} \\
& \left\{ \begin{array}{l} x^2 \\ x1 \end{array} \right\}^{1.06806} \left\{ \begin{array}{l} x^2 \\ Cb x2 x4 \end{array} \right\}^{0.36486} \left\{ \begin{array}{l} x^4 \\ x1 \end{array} \right\}^{0.46106} x5^2 \cdot \mu \\
& \#H1. - Cpl^{0.60247} \#3.6363748627922092 \cdot + 0.43429448190325176 \cdot \text{Log} x1 x50L^2 \cdot L + \\
& 0.000020466366099022835 \cdot \text{Cm} \text{Cstern} \left\{ \begin{array}{l} 1. - Cp + \\ -1. +4. Cp \end{array} \right\}^{0.121563} \\
& \left\{ \begin{array}{l} x^2 \\ x1 \end{array} \right\}^{1.06806} \left\{ \begin{array}{l} x^2 \\ Cb x2 x4 \end{array} \right\}^{0.36486} \left\{ \begin{array}{l} x^4 \\ x1 \end{array} \right\}^{0.46106} x5^2 \cdot \mu \\
& \#H1. - Cpl^{0.60247} \#3.6363748627922092 \cdot + 0.43429448190325176 \cdot \text{Log} x1 x50L^2 \cdot L + \\
& 0.000019991980129840186 \cdot Cb \cdot \text{Cm} \text{Cstern} \left\{ \begin{array}{l} 1. - Cp + \\ -1. +4. Cp \end{array} \right\}^{0.121563} \\
& \left\{ \begin{array}{l} x^2 \\ x1 \end{array} \right\}^{1.06806} \left\{ \begin{array}{l} x^2 \\ Cb x2 x4 \end{array} \right\}^{0.36486} \left\{ \begin{array}{l} x^4 \\ x1 \end{array} \right\}^{0.46106} x5^2 \cdot \mu \\
& \#H1. - Cpl^{0.60247} \#3.6363748627922092 \cdot + 0.43429448190325176 \cdot \text{Log} x1 x50L^2 \cdot L - \\
& 0.000012930406131435619 \cdot \text{Cm}^{3+2} \text{Cstern} \left\{ \begin{array}{l} 1. - Cp + \\ -1. +4. Cp \end{array} \right\}^{0.121563} \\
& \left\{ \begin{array}{l} x^2 \\ x1 \end{array} \right\}^{1.06806} \left\{ \begin{array}{l} x^2 \\ Cb x2 x4 \end{array} \right\}^{0.36486} \left\{ \begin{array}{l} x^4 \\ x1 \end{array} \right\}^{0.46106} x5^2 \cdot \mu \\
& \#H1. - Cpl^{0.60247} \#3.6363748627922092 \cdot + 0.43429448190325176 \cdot \text{Log} x1 x50L^2 \cdot L + \\
& 0.001518035101384475 \cdot \text{Cm} \text{Cw} \left\{ \begin{array}{l} 1. - Cp + \\ -1. +4. Cp \end{array} \right\}^{0.121563}
\end{aligned}$$

$$9.807^{\wedge}hb + 9.807^{\wedge}x4 + 0.03969110399999999^{\wedge}x5^2 \cdot \text{MM}^{\wedge}3 \cdot \text{''}$$

$$13.779184373405185^{\wedge} + 1.^{\wedge}lx5^{\wedge}l' \cdot l - 2.45175^{\wedge} \cdot \text{ABT} - 9.807^{\wedge}hb + 9.807^{\wedge}x4 + 0.03969110399999999^{\wedge}x5^2 \cdot \text{MM}^{\wedge}2 \cdot \text{''} +$$

$$10.179775898399999^{\wedge} \cdot 0.93^{\wedge} + \text{H}1.^{\wedge} - \text{Cpl}^{0.60247} \cdot 0.487118^{\wedge} \text{H}1.^{\wedge} + 0.011^{\wedge} \text{Cstern}l$$

$$1.^{\wedge} - \text{Cp} + \text{H}1.^{\wedge} - \text{Cpl}^{0.60247} \cdot \left\{ \begin{array}{l} 0.121563^{\wedge} \\ \text{J} \frac{x^2}{x1} \end{array} \right\} \cdot 1.06806^{\wedge} \cdot \left\{ \begin{array}{l} x1^2 \\ \text{C}b \cdot x2 \cdot x4 \end{array} \right\} \cdot 0.36486^{\wedge}$$

$$\text{J} \frac{x4}{x1} \cdot 0.46106^{\wedge} \cdot \left\{ \begin{array}{l} \text{ABT} \\ \text{C}b \end{array} \right\} + \text{Cm} \cdot x1 \cdot \text{J} 0.453^{\wedge} + 0.4425^{\wedge} \text{C}b -$$

$$0.2862^{\wedge} \text{C}m + 0.3696^{\wedge} \text{C}w - \frac{0.003467^{\wedge} \cdot x2}{x4} \cdot \text{H}x2 + 2.^{\wedge} \cdot x4 \cdot \text{L}l \cdot x5^2 \cdot \text{''}$$

$$\text{H}3.6363748627922092^{\wedge} + 0.43429448190325176^{\wedge} \text{Log} \otimes x1 \cdot x5 \text{DL}^2 \cdot \text{''}^{\wedge} 0.775^{\wedge} +$$

$$0.009331373722001119^{\wedge} \text{ABT} \cdot x5^2 \cdot \text{''} + \text{C}b \cdot \text{H}3.6363748627922092^{\wedge} + 0.43429448190325176^{\wedge} \text{Log} \otimes x1 \cdot x5 \text{DL}^2 \cdot \text{''}$$

$$0.004887613015821227^{\wedge}$$

ABT

$$1.^{\wedge} - \text{Cp} + \text{H}1.^{\wedge} - \text{Cpl}^{0.60247} \cdot \left\{ \begin{array}{l} 0.121563^{\wedge} \\ \text{J} \frac{x^2}{x1} \end{array} \right\}$$

$$\text{J} \frac{x^2}{x1} \cdot 1.06806^{\wedge}$$

$$\text{C}b \cdot x2 \cdot x4 \cdot \left\{ \begin{array}{l} x1^2 \\ 0.36486^{\wedge} \end{array} \right\}$$

$$\text{J} \frac{x4}{x1} \cdot 0.46106^{\wedge}$$

$$x5^2 \cdot \text{''}$$

$$\text{H} \text{C}b \text{H}1.^{\wedge} - \text{Cpl}^{0.60247} \cdot \text{H}3.6363748627922092^{\wedge} + 0.43429448190325176^{\wedge} \text{Log} \otimes x1 \cdot x5 \text{DL}^2 \cdot \text{''} \cdot \text{L} +$$

$$0.00005376374317403349^{\wedge}$$

ABT

Cstern

$$1.^{\wedge} - \text{Cp} + \text{H}1.^{\wedge} - \text{Cpl}^{0.60247} \cdot \left\{ \begin{array}{l} 0.121563^{\wedge} \\ \text{J} \frac{x^2}{x1} \end{array} \right\}$$

$$\begin{aligned}
 & \int_0^1 x^2 \ln(x) dx = -\frac{1}{3} \\
 & \int_0^1 x^2 \ln(x^2) dx = -\frac{2}{3} \\
 & \int_0^1 x^4 \ln(x) dx = -\frac{1}{5} \\
 & \int_0^1 x^5 \ln(x) dx = -\frac{1}{6} \\
 & \int_0^1 \ln(x) dx = -1
 \end{aligned}$$

$$\int_0^1 \ln(x) dx = -1 = -\frac{1}{1} = -\frac{1}{1}$$

Appendix C

Mathematical Form of the Constraint on the Metacentric Height

$$GM - GM_{min} \geq 0$$

where

$$GM - GM_{min} =$$

$$\begin{aligned}
 KM - & \frac{0.25 \cdot H \cdot 0.036 + 5.293490143503486 \cdot x_1^{2.1} \cdot H \cdot 5.76 \cdot Ntd^{2.2} + Hx^3 - x^4 \cdot 2.1}{Cb \cdot Hx^3 - x^4 \cdot x^4} + \\
 & -20862.2384999999996 \cdot x^3 - H \cdot 12. \cdot H - 828.3304293599999 \cdot + 0.601404 \cdot Ntd \cdot x_1 \cdot x_2 - 0.02159136 \cdot x_1 \\
 & x_2 \cdot x_3 + Cb \cdot H - 1512.10653491999998 \cdot + 0.199426079999999998 \cdot x_1 \cdot x_2 \cdot x_3 \\
 & H - 82.6702 \cdot + 0.050117 \cdot Ntd \cdot x_1 \cdot x_2 \cdot H \cdot 1.83 \cdot + 1.22 \cdot Ntd \cdot + x_3 \cdot + \\
 & H - 0.0918 \cdot + 0.8479 \cdot Cb \cdot H - 148.6129 \cdot + 0.0196 \cdot x_1 \cdot x_2 \cdot x_3 \\
 & H \cdot 1.83 \cdot + H \cdot 2.033333333333333 \cdot - 0.8133333333333332 \cdot Cb \cdot \\
 & IntegerPart@0.4098360655737705 \cdot H - 1.83 \cdot + x_3 \cdot LLLL \cdot \\
 & H - 828.3304293599999 \cdot - 1512.10653491999998 \cdot Cb + 0.601404 \cdot Ntd \cdot x_1 \cdot x_2 - \\
 & 0.02159136 \cdot x_1 \cdot x_2 \cdot x_3 + 0.199426079999999998 \cdot Cb \cdot x_1 \cdot x_2 \cdot x_3 \cdot + \\
 & 0.00043983364370304626 \cdot - 435.41364296081287 \cdot Hx_1 \cdot x_2 \cdot x_3^{0.724} \cdot - \\
 & 40.083164870667126 \cdot Hx_1 \cdot x_2 \cdot x_3^{1.003} \cdot - 0.01842450571162964 \cdot Cb \\
 & \int_k 1077.5862068965514 \cdot + 1. \cdot J - 8.3 \cdot + \frac{x_1^{1.691}}{x^3} \cdot \int_k Hx_1 \cdot x_2 \cdot x_3^{1.003} \cdot - \\
 & 0.037197176999979084 \cdot J - 8.3 \cdot + \frac{x_1^{1.691}}{x^5} \cdot Hx_1 \cdot x_2 \cdot x_3^{1.003} \cdot + \\
 & x_3 \cdot - 1458.6357039187228 \cdot Hx_1 \cdot x_2 \cdot x_3^{0.724} \cdot + 1. \cdot x_1 \cdot Hx_1 \cdot x_2 \cdot x_3^{0.724} \cdot - \\
 & 64.64612830341193 \cdot Hx_1 \cdot x_2 \cdot x_3^{1.003} \cdot + 0.00010854318961127322 \cdot Cb \\
 & \int_k -295002.5735002021 \cdot - 273.76238820818764 \cdot J - 8.3 \cdot + \frac{x_1^{1.691}}{x^3} \cdot + \\
 & 1077.5862068965519 \cdot J \cdot \frac{x_1^{2.2}}{x^3} \cdot + 1. \cdot J - 8.3 \cdot + \frac{x_1^{1.691}}{x^3} \cdot J \cdot \frac{x_1^{2.2}}{x^3} \cdot \int_k \\
 & Hx_1 \cdot x_2 \cdot x_3^{1.003} \cdot - 0.05999160706556627 \cdot J - 8.3 \cdot + \frac{x_1^{1.691}}{x^3} \cdot Hx_1 \cdot x_2 \cdot x_3^{1.003} \cdot - \\
 & 0.17171627830593794 \cdot J \cdot \frac{x_1^{2.2}}{x^3} \cdot Hx_1 \cdot x_2 \cdot x_3^{1.003} \cdot + 0.00009285950878661341 \cdot \\
 & Cb^2 \cdot \int_k 1077.5862068965514 \cdot + 1. \cdot J - 8.3 \cdot + \frac{x_1^{1.691}}{x^3} \cdot \int_k \frac{x_1^{2.2}}{x^3} \cdot Hx_1 \cdot x_2 \cdot x_3^{1.003} \cdot - \\
 & 0.00015935270626791042 \cdot J - 8.3 \cdot + \frac{x_1^{1.691}}{x^5} \cdot J \cdot \frac{x_1^{2.2}}{x^3} \cdot Hx_1 \cdot x_2 \cdot x_3^{1.003} \cdot -
 \end{aligned}$$

1.2362609499624329`

$$\frac{x^5}{k} - \frac{Cm \cdot H90 \cdot - \cdot hal^{1.37565}}{k} \cdot 1.78933298360292 \cdot *^{\wedge}10 c7^{3.78613} \cdot Cb$$

$$\begin{aligned} & \frac{\bar{a}^{\wedge}k}{k} - 1.41434649220055 \cdot \& \frac{ABT^{1.5}}{-hb + x4 + ABT \cdot x2 \cdot x4} - \\ & \frac{5.081833302662383 \cdot c16}{x1^{0.9}} - \frac{24.358395841320416 \cdot x2}{x1^{0.9}} + \\ & \frac{0.07135249685269171 \cdot x1}{x4 \cdot x1^{0.9}} - \\ & \frac{8.906116136247933 \cdot Cb \cdot x2 \cdot x4}{HCb \cdot x1 \cdot x2 \cdot x4^{0.666666666666667} \cdot x1^{0.9}} + \\ & 0 \cdot \bar{a} \cdot \frac{-0.666666666666667}{x1} \cdot CosB \end{aligned}$$

$$\frac{-13.34248601399447 \cdot + 53.59231882287779 \cdot Cp}{x1^{0.9}}$$

$$x1 \cdot \frac{x4}{x2} \cdot 1.07961 \cdot H1 \cdot AT - 1.25 \cdot Cm \cdot x2 \cdot x4 \cdot \frac{135.730345312}{k}$$

$$AT \cdot c6 \cdot x5^2 \cdot + 135.730345312 \cdot \frac{-0.00205 \cdot - 0.0010954451150103322}{k}$$

$$H - 0.04 \cdot + 1 \cdot c4 \cdot Cb^4 \cdot \bar{a} \cdot \frac{-1.41434649220055 \cdot \frac{ABT^{1.5}}{-hb+x4+ABT \cdot x2 \cdot x4} \cdot \frac{1}{x1}}{k} +$$

$$\frac{0.006 \cdot \frac{2.38 \cdot ABT}{Cb}}{H100 \cdot + x1^{0.16}} \cdot \frac{1}{k} + \frac{1}{Cm} \cdot x1 \cdot J0.453 \cdot + 0.4425 \cdot Cb -$$

$$0.2862 \cdot Cm + 0.3696 \cdot Cw - \frac{0.003467 \cdot x2}{x4} \cdot Hx2 + 2 \cdot x4LN$$

$$x5^2 \cdot + \frac{569.2916975592 \cdot ABT^{1.5} \cdot \bar{a}}{k} \cdot \frac{-0.666666666666667}{-1.5 \cdot hb + x4}$$

$$lx5 \cdot ' \cdot l' \cdot l - 2.45175 \cdot \frac{1}{ABT} - 9.807 \cdot hb + 9.807 \cdot x4 +$$

$$0.0396911039999999 \cdot x5^2 \cdot \frac{1}{3} \cdot \frac{1}{k}$$

$$13.779184373405185 \cdot + 1 \cdot lx5 \cdot ' \cdot l' \cdot l - 2.45175 \cdot \frac{1}{ABT} - 9.807 \cdot hb + 9.807 \cdot x4 + 0.0396911039999999 \cdot x5^2 \cdot \frac{1}{2} \cdot \frac{1}{k} +$$

$$\begin{aligned}
& 10.179775898399999 \cdot 0.93 + \frac{H1 \cdot - Cpl^{0.60247}}{k} \cdot 0.487118 \\
& H1 \cdot + 0.011 \cdot Csternl \cdot \frac{1 \cdot - Cp + \dots}{k} \cdot 0.121563 \\
& J \frac{x^2}{x1} \cdot 1.06806 \cdot j \frac{x1^2}{k} \cdot 0.36486 \cdot J \frac{x^4}{x1} \cdot 0.46106 \cdot \frac{V}{Z} \\
& J \frac{2.38 \cdot ABT}{Cb} + \dots \cdot Cm \cdot x1 \cdot J0.453 \cdot + 0.4425 \cdot Cb - 0.2862 \cdot Cm + \\
& 0.3696 \cdot Cw - \frac{0.003467 \cdot x^2}{x4} \cdot Hx2 + 2 \cdot x4 \cdot x5^2 \cdot \frac{V}{Z} \\
& H3.6363748627922092 + 0.43429448190325176 \\
& \text{Log} @ x1 \cdot x5 \cdot DL^{\wedge 2} \cdot \frac{V}{Z} \cdot \frac{V}{Z} \cdot \wedge 0.775 - \\
& 0.7891027340185741 \cdot x5 - \frac{Cm \cdot H90 \cdot - hal^{1.37565}}{k} \cdot 1.78933298360292 \cdot \wedge 10 \\
& c7^{3.78613} \cdot Cb \cdot \bar{a} \cdot - 1.41434649220055 \cdot \& \cdot \frac{ABT^{1.5}}{-hb + x4 + ABT \cdot x2 \cdot x4} - \\
& \frac{5.081833302662383 \cdot c16}{I \cdot \frac{V}{Z} \cdot x1} - \frac{24.358395841320416 \cdot x^2}{x1 \cdot \frac{V}{Z} \cdot x1} + \\
& \frac{0.07135249685269171 \cdot x1}{x4 \cdot \frac{V}{Z} \cdot x1} - \\
& \frac{8.906116136247933 \cdot Cb \cdot x2 \cdot x4}{HCb \cdot x1 \cdot x2 \cdot x4 \cdot \frac{V}{Z} \cdot x1} + 0 \cdot \bar{a} \cdot \frac{-12.05216110505605}{k \cdot \frac{V}{Z} \cdot x1} \\
& \text{CosB} \cdot \frac{-13.34248601399447 + 53.59231882287779 \cdot Cp}{I \cdot \frac{V}{Z} \cdot x1} \cdot x1 \\
& J \frac{x^4}{x2} \cdot 1.07961 \cdot H1 \cdot AT - 1.25 \cdot Cm \cdot x2 \cdot x4 \cdot \frac{V}{Z} + 135.730345312 \cdot AT \cdot c6 \cdot x5^2 + \\
& 135.730345312 \cdot -0.00205 \cdot - 0.0010954451150103322 \cdot H - 0.04 \cdot + 1 \cdot c4L \\
& Cb^4 \cdot \bar{a} \cdot - 1.41434649220055 \cdot \& \cdot \frac{ABT^{1.5}}{-hb + x4 + ABT \cdot x2 \cdot x4} \cdot \frac{V}{Z} + \frac{0.006}{H100 \cdot + x1 \cdot L^{0.16}} \cdot \frac{V}{Z}
\end{aligned}$$

$$\begin{aligned}
& \int \frac{2.38 \sqrt{ABT}}{Cb} + \frac{0.003467 x^2}{x^4} Hx^2 + 2. x4Lx5^2 + 569.2916975592 \sqrt{ABT}^{1.5} \\
& - \frac{0.566236570612214}{k} \int \frac{1}{x} dx - 2.45175 \sqrt{ABT} - 9.807 \sqrt{hb} + \\
& 9.807 x^4 + 0.03969110399999999 x^5 + 0.03969110399999999 x^5 + 0.03969110399999999 x^5 + 0.03969110399999999 x^5 \\
& 13.779184373405185 + 1. x5 \sqrt{1} - 2.45175 \sqrt{ABT} - 9.807 \sqrt{hb} + 9.807 x^4 + 0.03969110399999999 x^5 + 0.03969110399999999 x^5 + 0.03969110399999999 x^5 + 0.03969110399999999 x^5 \\
& 10.179775898399999 \int \frac{1}{k} dx + \int \frac{1}{k} dx - Cpl^{0.60247} \int \frac{1}{k} dx + 0.487118 \sqrt{Hl} + 0.011 \sqrt{Cstern} \\
& \int \frac{1}{k} dx - Cp + \int \frac{1}{k} dx - Cp + 0.121563 \sqrt{Hl} + 0.011 \sqrt{Cstern} \\
& \int \frac{1.06806}{x^2} dx + \int \frac{0.36486}{k Cb x^2 x^4} dx + \int \frac{0.46106}{x^4} dx + 0.46106 \sqrt{Hl} + 0.011 \sqrt{Cstern} \\
& \int \frac{2.38 \sqrt{ABT}}{Cb} + \frac{0.003467 x^2}{x^4} Hx^2 + 2. x4Lx5^2 + 569.2916975592 \sqrt{ABT}^{1.5} \\
& 0.3696 \sqrt{Cw} - \frac{0.003467 x^2}{x^4} Hx^2 + 2. x4Lx5^2 + 569.2916975592 \sqrt{ABT}^{1.5} \\
& H3.636748627922092 + 0.43429448190325176 \text{Log} x + 1 x5D^{0.775} - \\
& 3.090765690163143 x^{10} - 10 \int \frac{1}{k} dx - 2.2366662295036503 x^{10} c^{7.78613} \\
& \int \frac{1}{k} dx - 1.41434649220055 \sqrt{ABT}^{1.5} - \sqrt{hb} + x^4 + \sqrt{ABT} x^2 x^4 + \int \frac{1}{k} dx \\
& \int \frac{5.081833302662383}{k} dx - c16 - \frac{4.79323 x^2}{x^4} + \frac{0.0140407 x^4}{x^4} - \\
& \int \frac{1.75254 Cb x^2 x^4}{H Cb x^1 x^2 x^4} dx + 0. \sqrt{a} \int \frac{1}{k} dx \\
& \text{Cos} \int \frac{-13.34248601399447 + 53.59231882287779 \sqrt{Cp}}{x^4} dx + 1
\end{aligned}$$

$$\begin{aligned}
& x2 J1 \cdot - \frac{0.8 \cdot \text{AT}}{\text{Cm} x2 x4} x4 J \frac{x4}{x2} \frac{1.07961}{x2} + 135.730345312 \cdot \text{AT} c6 x5^2 + \\
& 135.730345312 \cdot -0.00205 - 0.0010954451150103322 \cdot \text{H} - 0.04 + 1 \cdot c4L \\
& \text{Cb}^4 \cdot \bar{a} - 1.41434649220055 \cdot \frac{\text{ABT}^5}{-hb+x4 \cdot \text{ABT} x2 x4} \cdot \frac{\text{H}}{x1} + \frac{0.006}{\text{H}100 \cdot + x1L^{0.16}} \\
& J \frac{2.38 \cdot \text{ABT}}{\text{Cb}} + \cdot \frac{\text{H}}{\text{Cm}} x1 J0.453 + 0.4425 \cdot \text{Cb} - 0.2862 \cdot \text{Cm} + 0.3696 \cdot \\
& \text{Cw} - \frac{0.003467 \cdot x2}{x4} \text{H} x2 + 2 \cdot x4L N x5^2 + \\
& 569.2916975592 \cdot \text{ABT}^{1.5} \bar{a} \cdot \frac{\text{H}}{-1.5 \cdot hb+x4} \cdot \text{I} x5 \cdot \text{I} - 2.45175 \cdot \text{ABT} - \\
& 9.807 \cdot hb + 9.807 \cdot x4 + 0.03969110399999999 \cdot x5^2 \cdot \text{MM}^3 \cdot \\
& 13.779184373405185 + 1 \cdot \text{I} x5 \cdot \text{I} - 2.45175 \cdot \text{ABT} - 9.807 \cdot hb + \\
& 9.807 \cdot x4 + 0.03969110399999999 \cdot x5^2 \cdot \text{MM}^2 \cdot \text{M} + \\
& 10.179775898399999 \cdot 0.93 + \frac{\text{H}}{\text{H}1 \cdot - \text{Cpl}^{0.6024}} \cdot 0.487118 \cdot \\
& \text{H}1 \cdot + 0.011 \cdot \text{CsternL} \cdot \frac{\text{H}}{\text{I} \cdot - \text{Cp} + \frac{\text{H}}{-1 \cdot +4 \cdot \text{Cp}}} \cdot 0.121563 \cdot \\
& J \frac{x2}{x1} \frac{1.06806}{x1} \cdot J \frac{x12}{\text{Cb} x2 x4} \cdot \frac{0.36486}{x1} \cdot J \frac{x4}{x1} \frac{0.46106}{x1} \\
& J \frac{2.38 \cdot \text{ABT}}{\text{Cb}} + \cdot \frac{\text{H}}{\text{Cm}} x1 J0.453 + 0.4425 \cdot \text{Cb} - 0.2862 \cdot \text{Cm} + \\
& 0.3696 \cdot \text{Cw} - \frac{0.003467 \cdot x2}{x4} \text{H} x2 + 2 \cdot x4L N x5^2 \cdot \\
& \text{H}3.6363748627922092 + 0.43429448190325176 \cdot \text{Log} @ x1 x5DL^2 \cdot \text{H}^2 \cdot \\
& 40896.14657063999 + 0.601404 \cdot \text{Ntd} x1 x2 - \\
& 0.02159136 \\
& x1 \\
& x2 \\
& x3 + \\
& \text{Cb}
\end{aligned}$$

$$H - 1512.1065349199998^{\cdot} + 0.19942607999999998^{\cdot} x_1 x_2 x_3 L +$$

$$1.03^{\cdot} \left\{ 0.6197720682895518^{\cdot} H x_1 x_2 x_3 L^{0.724^{\cdot}} + 0.05705477170296265^{\cdot} \right.$$

$$H_1^{\cdot} + 0.49532^{\cdot} C b L$$

$$\left\{ 1^{\cdot} + 0.000928^{\cdot} J - 8.3^{\cdot} + \frac{x_1^{1.691^{\cdot}}}{x_3} \right\} H x_1 x_2 x_3 L^{1.003^{\cdot}} + 0.0011232166043994344^{\cdot}$$

$$\left\{ x_5 \right\} \left\{ H 90^{\cdot} - h a l^{1.57565^{\cdot}} \right\} 2.2366662295036503^{\cdot} * \wedge 10 c 7^{3.78613^{\cdot}} C b$$

$$\left\{ \bar{a}^{\wedge} \right\} - 1.41434649220055^{\cdot} \& \left\{ \frac{A B T^{1.5^{\cdot}}}{-h b + x_4 + A B T x_2 x_4} + \frac{1}{x_1} \right\} \left\{ 5.081833302662383^{\cdot} \right\} - c 16 - \frac{4.79323^{\cdot} x_2}{x_1} + \frac{0.0140407^{\cdot} x_1}{x_4} - \frac{1.75254^{\cdot} C b x_2 x_4}{H C b x_1 x_2 x_4 L^{0.6666666666666667^{\cdot}}} + 0^{\cdot} \bar{a} - \frac{12.953161110595605^{\cdot}}{x_1}$$

$$\cos B \frac{-13.34248601399447^{\cdot} + 53.59231882287779^{\cdot} C b}{x_1} x_1$$

$$x_2 J_1^{\cdot} - \frac{0.8^{\cdot} A T}{C m x_2 x_4} x_4 J \frac{x_4}{x_2}^{1.07961^{\cdot}} + 135.730345312^{\cdot} A T c 6 x_5^{2^{\cdot}} +$$

$$135.730345312^{\cdot} \left\{ -0.00205^{\cdot} - 0.0010954451150103322^{\cdot} H - 0.04^{\cdot} + 1^{\cdot} c 4 L \right.$$

$$C b 4^{\cdot} \bar{a} - 1.41434649220055^{\cdot} \left\{ \frac{A B T^{1.5^{\cdot}}}{-h b + x_4 + A B T x_2 x_4} \right\} \cdot \frac{1}{x_1} + \frac{0.006^{\cdot}}{H 100^{\cdot} + x_1 L^{0.16^{\cdot}}}$$

$$J \frac{2.38^{\cdot} A B T}{C b} + \frac{1}{C m} x_1 J 0.453^{\cdot} + 0.4425^{\cdot} C b - 0.2862^{\cdot} C m + 0.3696^{\cdot} C w -$$

$$\frac{0.003467^{\cdot} x_2}{x_4} H x_2 + 2^{\cdot} x_4 L N x_5^{2^{\cdot}} + \left\{ 569.2916975592^{\cdot} A B T^{1.5^{\cdot}} \right.$$

$$\left. \bar{a} \left\{ \frac{-0.566276206123146^{\cdot}}{H x_1 x_2 x_3 L} \right\} l x_5^{\cdot} l' l - 2.45175^{\cdot} \cdot \frac{1}{A B T} - 9.807^{\cdot} h b + \right.$$

$$9.807^{\cdot} x_4 + 0.039691103999999999^{\cdot} x_5^{2^{\cdot}} \left. \frac{1}{M M^{\wedge} 3^{\cdot}} \right\}$$

$$l 3.779184373405185^{\cdot} + 1^{\cdot} l x_5^{\cdot} l' l - 2.45175^{\cdot} \cdot \frac{1}{A B T} - 9.807^{\cdot}$$

$$\begin{aligned}
& hb + 9.807 x^4 + 0.03969110399999999 x^5 + \dots \\
& 10.179775898399999 \cdot 0.93 + \dots \\
& H1. + 0.011 Csternl + \dots \\
& J \frac{x^2}{x1} + \dots \\
& J \frac{2.38 \cdot ABT}{Cb} + \dots \\
& 0.3696 Cw - \dots \\
& H3.6363748627922092 + 0.43429448190325176 \text{Log}x1 x5D^{2.} + \dots \\
& 0.00041414026809651473 \cdot 2.236662295036503 \cdot *^10 \\
& c7^{3.78613} Cb \bar{a} - 1.41434649220055 \cdot \dots \\
& J \frac{5.081833302662383}{x1} - c16 - \dots \\
& H Cb x1 x2 x4 + \dots \\
& -13.34248601399447 + 53.59231882287779 Cb x1 \\
& x2 J1. - \dots \\
& 135.730345312 - 0.00205 - 0.0010954451150103322 H - 0.04 + 1. c4L \\
& Cb^4 \bar{a} - 1.41434649220055 \cdot \dots \\
& J \frac{2.38 \cdot ABT}{Cb} + \dots
\end{aligned}$$

$$\begin{aligned}
& 0.3696 \text{ Cw} - \frac{0.003467 \cdot x^2}{x^4} \text{ Hx}^2 + 2. \cdot x^4 \text{ LN} x^5^2 \cdot + \\
& 569.2916975592 \cdot \text{ABT}^{1.5} \cdot \bar{a} \cdot \left\{ \frac{\text{ABT}}{\text{hb} + x^4} \right\} \cdot \text{lx}^5 \cdot \text{I} \cdot \text{I} - 2.45175 \cdot \cdot \frac{\text{ABT}}{\text{ABT}} - \\
& 9.807 \cdot \text{hb} + 9.807 \cdot x^4 + 0.03969110399999999 \cdot x^5^2 \cdot \text{MM}^3 \cdot \cdot \\
& 13.779184373405185 \cdot + 1. \cdot \text{lx}^5 \cdot \text{I} \cdot \text{I} - 2.45175 \cdot \cdot \frac{\text{ABT}}{\text{ABT}} - 9.807 \cdot \text{hb} + \\
& 9.807 \cdot x^4 + 0.03969110399999999 \cdot x^5^2 \cdot \text{MM}^2 \cdot \cdot + \\
& 10.179775898399999 \cdot \left\{ 0.93 \cdot + \frac{\text{H1} \cdot - \text{Cpl}}{\text{H1} \cdot - \text{Cpl}} \right\} \cdot 0.487118 \cdot \text{H1} \cdot + 0.011 \cdot \text{Csternl} \\
& 1. \cdot - \text{Cp} + \frac{0.121563 \cdot}{-1. + 4. \cdot \text{Cp}} \cdot \\
& \frac{\text{J} \cdot x^2}{x^1} \cdot 1.06806 \cdot \frac{\text{J} \cdot x^2}{\text{k} \cdot \text{Cb} \cdot x^2 \cdot x^4} \cdot 0.36486 \cdot \frac{\text{J} \cdot x^4}{x^1} \cdot 0.46106 \cdot \frac{\text{VY}}{\text{Z}} \\
& \frac{2.38 \cdot \text{ABT}}{\text{Cb}} \cdot + \cdot \frac{\text{ABT}}{\text{ABT}} \cdot \text{Cm} \cdot x^1 \cdot 0.453 \cdot + 0.4425 \cdot \text{Cb} - 0.2862 \cdot \text{Cm} + \\
& 0.3696 \text{ Cw} - \frac{0.003467 \cdot x^2}{x^4} \text{ Hx}^2 + 2. \cdot x^4 \text{ LN} x^5^2 \cdot \cdot \\
& 13.6363748627922092 \cdot + 0.43429448190325176 \cdot \text{Log} \cdot x^1 \cdot x^5 \text{DL}^2 \cdot \cdot
\end{aligned}$$

Appendix D

Mathematical Form of the Constraint on the Rolling Period

$$\text{Troll} - \text{Trollmin} \geq 0$$

where

$$\text{Troll} - \text{Trollmin} =$$

$$x_2^2 - 668.845$$

$$\begin{aligned} & \frac{1}{K} \left(-20862.238499999996 x_3 - 112. H - 828.3304293599999 + 0.601404 \text{ Ntd} x_1 x_2 - \right. \\ & \quad 0.02159136 x_1 x_2 x_3 + \text{Cb} H - 1512.1065349199998 + 0.19942607999999998 \\ & \quad x_1 x_2 x_3 L H - 82.6702 + 0.050117 \text{ Ntd} x_1 x_2 L H 1.83 + 1.22 \text{ Ntd} + x_3 L + \\ & \quad H - 0.0918 + 0.8479 \text{ Cb} L H - 148.6129 + 0.0196 x_1 x_2 x_3 L \\ & \quad H 1.83 + H 2.033333333333333 - 0.813333333333332 \text{ Cb} L \\ & \quad \text{IntegerPart} @ 0.4098360655737705 H - 1.83 + x_3 L L L L \cdot \\ & \quad H - 828.3304293599999 - 1512.1065349199998 \text{ Cb} + 0.601404 \text{ Ntd} x_1 x_2 - \\ & \quad \left. 0.02159136 x_1 x_2 x_3 + 0.19942607999999998 \text{ Cb} x_1 x_2 x_3 L + \right. \\ & \quad \left. 0.00043983364370304626 \right) - 435.41364296081287 H x_1 x_2 x_3 L^{0.724} - \\ & \quad 40.083164870667126 H x_1 x_2 x_3 L^{1.003} - 0.01842450571162964 \text{ Cb} \\ & \quad \int_K 1077.5862068965514 + 1. J - 8.3 + \frac{x_1}{x_3} \frac{1.691}{x_3} H x_1 x_2 x_3 L^{1.003} - \\ & \quad 0.037197176999979084 J - 8.3 + \frac{x_1}{x_3} \frac{1.691}{x_3} H x_1 x_2 x_3 L^{1.003} + \\ & \quad \left. x_3 \right) - 1458.6357039187228 H x_1 x_2 x_3 L^{0.724} + 1. x_1 H x_1 x_2 x_3 L^{0.724} - \\ & \quad 64.64612830341193 H x_1 x_2 x_3 L^{1.003} + 0.00010854318961127322 \text{ Cb} \\ & \quad \int_K - 295002.5735002021 - 273.76238820818764 J - 8.3 + \frac{x_1}{x_3} \frac{1.691}{x_3} + \\ & \quad 1077.5862068965519 \frac{x_1}{x_3} \frac{2.}{x_3} J - 8.3 + \frac{x_1}{x_3} \frac{1.691}{x_3} J \frac{x_1}{x_3} \frac{2.}{x_3} \\ & \quad H x_1 x_2 x_3 L^{1.003} - 0.05999160706556627 J - 8.3 + \frac{x_1}{x_3} \frac{1.691}{x_3} H x_1 x_2 x_3 L^{1.003} - \\ & \quad 0.17171627830593794 \frac{x_1}{x_3} \frac{2.}{x_3} H x_1 x_2 x_3 L^{1.003} + 0.00009285950878661341 \text{ Cb} \\ & \quad \int_K 1077.5862068965514 + 1. J - 8.3 + \frac{x_1}{x_3} \frac{1.691}{x_3} \\ & \quad \left. J \frac{x_1}{x_3} \frac{2.}{x_3} H x_1 x_2 x_3 L^{1.003} - 0.00015935270626791042 \right) \end{aligned}$$

$$J - 8.3 + \frac{x^1}{x^3}^{1.691} J \frac{x^1}{x^5}^{2.0} Hx1 x2 x3^{1.003} - 1.2362609499624329$$

$$x5 - \frac{Cm H90}{-hal}^{1.37565} 1.78933298360292 * 10 c7^{3.78613} Cb$$

$$\bar{a} - 1.41434649220055 \& \frac{ABT^{1.5}}{-hb + x4 + ABT x2 x4} -$$

$$\frac{5.081833302662383 c16}{x1^{1.9}} -$$

$$\frac{24.358395841320416 x2}{x1^{1.9}} +$$

$$\frac{0.07135249685269171 x1}{x4^{1.9}} -$$

$$\frac{8.906116136247933 Cb x2 x4}{Hcb x1 x2 x4^{0.6666666666666667} x1^{1.9}} +$$

$$0. \bar{a} \frac{-12.052161110595605}{x1^{1.9}} \cos B$$

$$\frac{-13.34248601399447 + 53.59231882287779 Cn}{x1^{1.9}}$$

$$x1 \frac{x4}{x2}^{1.07961} H1. AT - 1.25 Cm x2 x4 +$$

$$135.730345312 AT c6 x5^{2.0} + 135.730345312$$

$$-0.00205 - 0.0010954451150103322 H - 0.04 + 1. c4L$$

$$Cb^4 \bar{a} - 1.41434649220055 \frac{ABT^{1.5}}{-hb+x4+ABT x2 x4}$$

$$\frac{0.006}{H100. + x1^{1.16}} J \frac{2.38 ABT}{Cb} +$$

$$Cm x1 J 0.453 + 0.4425 Cb - 0.2862 Cm +$$

$$0.3696 Cw - \frac{0.003467 x2}{x4} Hx2 + 2. x4LN$$

$$x5^{2.0} + 569.2916975592 ABT^{1.5} \bar{a} \frac{-0.6666666666666667}{-1.5 hb+x4}$$

$$lx5' l' l - 2.45175 \cdot \frac{ABT}{-hb+x4} - 9.807 hb + 9.807 x4 +$$

$$\begin{aligned}
& 0.03969110399999999 \cdot x^5 \cdot \text{MM}^3 \\
& 13.779184373405185 \cdot 1 \cdot \text{Ix5} \cdot \text{I} \cdot \text{I} - 2.45175 \cdot \text{ABT} - 9.807 \cdot \text{hb} + 9.807 \cdot x^4 + \\
& 0.03969110399999999 \cdot x^5 \cdot \text{MM}^2 \cdot \text{M} + \\
& 10.179775898399999 \cdot 0.93 + \text{H1} \cdot \text{Cpl}^{0.60247} \\
& 0.487118 \cdot \text{H1} + 0.011 \cdot \text{CsternL} \\
& \text{I} \cdot \text{Cp} + \text{J} \cdot \frac{x^2}{x1}^{1.06806} \\
& \text{Cb} \cdot x^2 \cdot x^4 \cdot \text{J} \cdot \frac{x^4}{x1}^{0.36486} \cdot \text{J} \cdot \frac{x^4}{x1}^{0.46106} \cdot \text{J} \cdot \frac{2.38 \cdot \text{ABT}}{\text{Cb}} + \\
& \text{Cm} \cdot x1 \cdot \text{J} \cdot 0.453 + 0.4425 \cdot \text{Cb} - 0.2862 \cdot \text{Cm} + \\
& 0.3696 \cdot \text{Cw} - \frac{0.003467 \cdot x^2}{x^4} \cdot \text{Hx2} + 2 \cdot x^4 \cdot \text{LN} \cdot x^5 \\
& \text{H3.6363748627922092} + 0.43429448190325176 \cdot \\
& \text{Log} \cdot x1 \cdot x^5 \cdot \text{DL}^2 \cdot \text{V}^{\wedge 0.775} - 0.7891027340185741 \cdot \\
& x^5 \cdot \text{Cm} \cdot \text{H90} \cdot \text{hal}^{1.37565} \cdot 1.78933298360292 \cdot *^{\wedge 10} \cdot c^{7^{3.78613}} \cdot \text{Cb} \\
& \tilde{a}^{\wedge 3} - 1.41434649220055 \cdot \& \cdot \frac{\text{ABT}^{1.5}}{-\text{hb} + x^4 + \text{ABT} \cdot x^2 \cdot x^4} - \\
& \frac{5.081833302662383 \cdot c^{16}}{\text{I} \cdot \frac{x^2}{x1}^{0.9}} - \frac{24.358395841320416 \cdot x^2}{x1 \cdot \frac{x^2}{x1}^{0.9}} + \\
& \frac{0.07135249685269171 \cdot x^1}{x^4 \cdot \frac{x^2}{x1}^{0.9}} - \\
& \frac{8.906116136247933 \cdot \text{Cb} \cdot x^2 \cdot x^4}{\text{HCb} \cdot x1 \cdot x^2 \cdot x^4 \cdot 0.666666666666667 \cdot \frac{x^2}{x1}^{0.9}} + \\
& 0 \cdot \tilde{a} \cdot \frac{x^2}{x1} \cdot \text{CosB}
\end{aligned}$$

$$\begin{aligned}
& -13.34248601399447^{\wedge} + 53.59231882287779^{\wedge} \text{Cp} \\
& \frac{1}{x1} \\
& x1 \frac{x4}{x2}^{1.07961} \text{H1.}^{\wedge} \text{AT} - 1.25^{\wedge} \text{Cm} x2 x4 \\
& 135.730345312^{\wedge} \text{AT} c6 x5^{2.} + 135.730345312^{\wedge} \\
& -0.00205^{\wedge} - 0.0010954451150103322^{\wedge} \text{H} - 0.04^{\wedge} + 1.^{\wedge} c4 \text{Cb}^{4.} \\
& \bar{a}^{-1.41434649220055^{\wedge} \text{ABT}^{1.5} \cdot \frac{\text{Hb} + x4 + \text{ABT} x2 x4}{x1} + \frac{0.006^{\wedge}}{\text{H}100.^{\wedge} + x1 \text{L}^{0.16}}} \\
& \frac{2.38^{\wedge} \text{ABT}}{\text{Cb}} + \text{Cm} x1 \text{J}0.453^{\wedge} + 0.4425^{\wedge} \text{Cb} - 0.2862^{\wedge} \text{Cm} + \\
& 0.3696^{\wedge} \text{Cw} - \frac{0.003467^{\wedge} x2}{x4} \text{H} x2 + 2.^{\wedge} x4 \text{LN} \\
& x5^{2.} + 569.2916975592^{\wedge} \text{ABT}^{1.5} \bar{a}^{-0.566326570612241^{\wedge} \frac{\text{ABT}}{\text{Hb} + x4}} \\
& 1 x5^{\wedge} \text{I}^{\wedge} \text{I} - 2.45175^{\wedge} \cdot \frac{\text{ABT}}{\text{Hb} + x4} - 9.807^{\wedge} \text{hb} + 9.807^{\wedge} x4 + \\
& 0.03969110399999999^{\wedge} x5^{2.} \text{MM}^{\wedge} 3. \\
& 13.779184373405185^{\wedge} + 1.^{\wedge} 1 x5^{\wedge} \text{I}^{\wedge} \text{I} - 2.45175^{\wedge} \cdot \frac{\text{ABT}}{\text{Hb} + x4} - 9.807^{\wedge} \text{hb} + \\
& 9.807^{\wedge} x4 + 0.03969110399999999^{\wedge} x5^{2.} \text{MM}^{\wedge} 2. \\
& 10.179775898399999^{\wedge} 0.93^{\wedge} + \frac{\text{H}1.^{\wedge} - \text{Cpl}^{0.60247}}{\text{H}1.^{\wedge} - \text{Cp} + \frac{\text{H}1.^{\wedge} - \text{Cp}}{-1.^{\wedge} + 4. \text{Cp}}} 0.487118^{\wedge} \\
& \text{H}1.^{\wedge} + 0.011^{\wedge} \text{CsternL} \frac{0.121563^{\wedge}}{\text{H}1.^{\wedge} - \text{Cp} + \frac{\text{H}1.^{\wedge} - \text{Cp}}{-1.^{\wedge} + 4. \text{Cp}}} \\
& \frac{x2}{x1}^{1.06806} \frac{x1^{2.}}{\text{Cb} x2 x4}^{0.36486} \frac{x4}{x1}^{0.46106} \\
& \frac{2.38^{\wedge} \text{ABT}}{\text{Cb}} + \text{Cm} x1 \text{J}0.453^{\wedge} + 0.4425^{\wedge} \text{Cb} - 0.2862^{\wedge} \text{Cm} + \\
& 0.3696^{\wedge} \text{Cw} - \frac{0.003467^{\wedge} x2}{x4} \text{H} x2 + 2.^{\wedge} x4 \text{LN} x5^{2.} \\
& \text{H}3.6363748627922092^{\wedge} + 0.43429448190325176^{\wedge} \\
& \text{Log} x1 x5 \text{L}^{\wedge} 2. \frac{\text{H}1.^{\wedge}}{\text{H}1.^{\wedge} - \text{Cp} + \frac{\text{H}1.^{\wedge} - \text{Cp}}{-1.^{\wedge} + 4. \text{Cp}}}^{0.775} -
\end{aligned}$$

$$3.090765690163143 \cdot 10^{-10} \int_0^1 \frac{1}{\sqrt{1-x^2}} dx - \frac{1}{2} \int_0^1 \frac{1}{\sqrt{1-x^2}} dx + 2.2366662295036503 \cdot 10^{-10}$$

$$c^{7.78613} Cb \bar{a} - 1.41434649220055$$

$$\& \int_0^1 \frac{ABT^{1.5}}{-hb + x^4 + ABT^2 x^4} dx + \int_0^1 \frac{1}{x^{1.9}}$$

$$\int_0^1 \frac{5.081833302662383}{x} dx - c16 - \int_0^1 \frac{4.79323 x^2}{x^1} dx + \int_0^1 \frac{0.0140407 x^1}{x^4} dx - \int_0^1 \frac{1.75254 Cb x^2 x^4}{H Cb x^1 x^2 x^4} dx + 0. \bar{a} \int_0^1 \frac{13.052161110505605}{x^{1.2}}$$

$$\text{CosB} \int_0^1 \frac{-13.34248601399447 + 53.59231882287779 C_p}{x^1} dx$$

$$x1 x2 J1 - \int_0^1 \frac{0.8 AT}{Cm x^2 x^4} dx + \int_0^1 \frac{x^4}{x^2} dx + \int_0^1 \frac{1.07961}{x^2} dx$$

$$135.730345312 AT c6 x5^2 + 135.730345312$$

$$\int_0^1 -0.00205 - 0.0010954451150103322 H - 0.04 + 1. c4L Cb^4$$

$$\bar{a}^{-1.41434649220055} \int_0^1 \frac{ABT^{1.5}}{-hb+x^4+ABT^2 x^4} dx \cdot \int_0^1 \frac{1}{x^1} dx + \int_0^1 \frac{0.006}{H100. + x1^{0.16}}$$

$$\int_0^1 \frac{2.38 ABT}{Cb} dx + \int_0^1 \frac{1}{Cm x^1} dx + 0.453 + 0.4425 Cb - 0.2862 Cm + 0.3696 Cw - \int_0^1 \frac{0.003467 x^2}{x^4} dx + 2. x4LN x5^2 +$$

$$\int_0^1 \frac{569.2916975592 ABT^{1.5}}{x^1} dx \bar{a}^{-1.41434649220055} \int_0^1 \frac{1}{x^1} dx - 2.45175 \cdot \int_0^1 \frac{1}{ABT}$$

$$9.807 hb + 9.807 x4 + 0.03969110399999999 x5^2 \cdot \int_0^1 \frac{1}{x^3} dx$$

$$13.779184373405185 + 1. \int_0^1 \frac{1}{x^5} dx - 2.45175 \cdot \int_0^1 \frac{1}{ABT} dx - 9.807 hb + 9.807 x4 + 0.03969110399999999 x5^2 \cdot \int_0^1 \frac{1}{x^2} dx +$$

$$\int_0^1 \frac{10.179775898399999}{x} dx + 0.93 + \int_0^1 \frac{1}{H1. - Cpl^{0.60247}} dx + 0.487118$$

$$H1. + 0.011 CsternL \int_0^1 \frac{1}{x^1} dx - C_p + \int_0^1 \frac{1}{-1. + 4. C_p} dx^{0.121563}$$

$$\begin{aligned}
& \left(\frac{1.06806}{x^2} \right) \left(\frac{0.36486}{x^2} \right) \left(\frac{0.46106}{x^4} \right) \left(\frac{2.38}{C_b} \right) \left(\frac{ABT}{C_b} \right) + \left(\frac{0.003467}{x^4} \right) \left(\frac{0.4425}{C_b} \right) \left(\frac{0.453}{C_m} \right) \left(\frac{0.2862}{C_m} \right) + \\
& 0.3696 C_w - \left(\frac{0.003467}{x^4} \right) \left(\frac{0.4425}{C_b} \right) \left(\frac{0.453}{C_m} \right) \left(\frac{0.2862}{C_m} \right) + \\
& 3.6363748627922092 + 0.43429448190325176 \log(x) x^{5.2} + \\
& 40896.14657063999 + 0.601404 N_{td} x^2 - \\
& 0.02159136 x^1 \\
& x^2 \\
& x^3 + C_b \\
& H - 1512.1065349199998 + \\
& 0.19942607999999998 x^1 x^2 x^3 + \\
& 1.03 \left(\frac{0.6197720682895518}{x^1} \right) \left(\frac{0.724}{x^2} \right) \left(\frac{0.05705477170296265}{x^1} \right) \left(\frac{0.49532}{C_b} \right) + \\
& \left(\frac{1.691}{x^3} \right) \left(\frac{0.000928}{x^1} \right) \left(\frac{8.3}{x^1} \right) + \\
& H x^1 x^2 x^3^{1.003} + 0.0011232166043994344 \\
& \left(\frac{2.2366662295036503}{x^5} \right) \left(\frac{7.78613}{x^1} \right) C_b \\
& \left(\frac{1.41434649220055}{x^1} \right) \left(\frac{ABT^{1.5}}{x^4} \right) + \\
& -hb + x^4 + \left(\frac{4.79323}{x^1} \right) \left(\frac{5.081833302662383}{x^1} \right) \left(\frac{16}{x^1} \right) - \left(\frac{0.0140407}{x^4} \right) \left(\frac{1.75254}{C_b} \right) \left(\frac{0.6666666666666667}{x^4} \right) + \\
& 0. \bar{a} \left(\frac{13.953161110805605}{x^1} \right) \cos B \\
& -13.34248601399447 + 53.59231882287779 C_p
\end{aligned}$$

$$\begin{aligned}
& x^1 x^2 J_1 - \frac{0.8 \text{ AT}}{C_m x^2 x^4} x^4 J_1 + \frac{1.07961}{x^2} + \\
& 135.730345312 \text{ AT } c_6 x^5 + 135.730345312 \\
& -0.00205 - 0.0010954451150103322 \text{ H} - 0.04 + 1. c_4 L C_b^4 \\
& \bar{a}^{-1.41434649220055} \frac{\text{AT}^5}{-hb+x^4 \text{ ABT}^2 x^4} \cdot \frac{1}{x^1} + \frac{0.006}{H100. + x^{11} 0.16} \\
& J_{C_b} \frac{2.38 \text{ ABT}}{C_b} + C_m x^1 J_0.453 + 0.4425 C_b - 0.2862 C_m + \\
& 0.3696 C_w - \frac{0.003467 x^2}{x^4} H x^2 + 2. x^4 L N \\
& x^5 + 569.2916975592 \text{ ABT}^{1.5} \bar{a}^{-0.66329637062112} \\
& l x^5 \text{ I}' \text{ I} - 2.45175 \text{ ABT} - 9.807 \text{ hb} + 9.807 x^4 + \\
& 0.03969110399999999 x^5 \text{ I}^3 \\
& 13.779184373405185 + 1. l x^5 \text{ I}' \text{ I} - 2.45175 \text{ ABT} - 9.807 \text{ hb} + \\
& 9.807 x^4 + 0.03969110399999999 x^5 \text{ I}^2 \\
& 10.179775898399999 \text{ I}^{0.93} + \frac{0.487118}{H1. - C_p L^{0.60247}} \\
& H1. + 0.011 C_{stern} \frac{1. - C_p + C_p}{1. + C_p}^{0.121563} \\
& J_{x^1} \frac{1.06806}{x^1} J_{C_b} \frac{x^1 2.}{C_b x^2 x^4} \frac{0.36486}{x^1} J_{x^1} \frac{0.46106}{x^1} \\
& J_{C_b} \frac{2.38 \text{ ABT}}{C_b} + C_m x^1 J_0.453 + 0.4425 C_b - 0.2862 C_m + \\
& 0.3696 C_w - \frac{0.003467 x^2}{x^4} H x^2 + 2. x^4 L N x^5 \\
& H3.6363748627922092 + 0.43429448190325176 \\
& \text{Log} @ x^1 x^5 L^2 \cdot \frac{1}{x^1} \frac{1}{x^1}^{0.775} + \\
& 0.00041414026809651473 \frac{1}{H90. - ha L^{1.37565}} 2.236662295036503 \cdot 10 c_7^{3.78613}
\end{aligned}$$

$$\begin{aligned}
& Cb \bar{a}^k - 1.41434649220055 \cdot \frac{ABT^{1.5}}{-hb + x4 + ABT^2 x2 x4} + \frac{1}{x1^{1.9}} \\
& \int_k 5.081833302662383 \int_k -c16 - \frac{4.79323 \cdot x2}{x1} + \frac{0.0140407 \cdot x1}{x4} - \\
& \frac{1.75254 \cdot Cb x2 x4}{HCb x1 x2 x4} + 0 \cdot \bar{a} - \frac{12.95314110595605}{x1^{2.9}} \\
& CosB = \frac{-13.34248601399447 + 53.59231882287779 \cdot Cp}{x1} \\
& x2 J1 \cdot - \frac{0.8 \cdot AT}{Cm x2 x4} x4 J \frac{1.07961}{x2} + 135.730345312 \cdot AT c6 x5^{2.2} + \\
& 135.730345312 \cdot -0.00205 - 0.0010954451150103322 \cdot H - 0.04 \cdot + 1 \cdot c4L \\
& Cb^4 \cdot \bar{a}^{-1.41434649220055} \cdot \frac{ABT^{1.5}}{-hb+x4+ABT^2 x2 x4} \cdot \frac{1}{x1} + \frac{0.006}{H100 \cdot + x1L^{0.16}} \\
& J \frac{2.38 \cdot ABT}{Cb} + \frac{1}{Cm} x1 J0.453 + 0.4425 \cdot Cb - 0.2862 \cdot Cm + \\
& 0.3696 \cdot Cw - \frac{0.003467 \cdot x2}{x4} Hx2 + 2 \cdot x4LN x5^{2.2} + \\
& 569.2916975592 \cdot ABT^{1.5} \bar{a} \cdot \frac{1}{x5} \cdot | \cdot -2.45175 \cdot \frac{1}{ABT} - \\
& 9.807 \cdot hb + 9.807 \cdot x4 + 0.03969110399999999 \cdot x5^{2.2} \cdot \frac{1}{MM} \wedge 3 \\
& 13.779184373405185 + 1 \cdot |x5 \cdot | \cdot | -2.45175 \cdot \frac{1}{ABT} - 9.807 \cdot hb + \\
& 9.807 \cdot x4 + 0.03969110399999999 \cdot x5^{2.2} \cdot \frac{1}{MM} \wedge 2 \cdot \frac{1}{M} + \\
& 10.179775898399999 \int_k 0.93 \int_k + \frac{1}{H1 \cdot - Cpl^{0.60247}} \int_k 0.487118 \int_k \\
& H1 \cdot + 0.011 \cdot Csternl \int_k \frac{1}{1 \cdot - Cp + \frac{1}{-1 \cdot +4 \cdot Cp}} \int_k 0.121563 \int_k \\
& J \frac{x2}{x1} 1.06806 \int_k \frac{x1^{2.2}}{Cb x2 x4} \int_k 0.36486 \int_k \frac{x4}{x1} \int_k 0.46106 \int_k \\
& J \frac{2.38 \cdot ABT}{Cb} + \frac{1}{Cm} x1 J0.453 + 0.4425 \cdot Cb - 0.2862 \cdot Cm + \\
& 0.3696 \cdot Cw - \frac{0.003467 \cdot x2}{x4} Hx2 + 2 \cdot x4LN x5^{2.2}
\end{aligned}$$

$$\begin{aligned}
& 3.6363748627922092^{\wedge} + 0.43429448190325176^{\wedge} \text{Log}x1 x50L^{2^{\wedge}} \\
& 4.20862.238499999996^{\wedge} x3 + H12.^{\wedge} H- 828.3304293599999^{\wedge} + 0.601404^{\wedge} \text{Ntd} x1 x2 - \\
& \quad 0.02159136^{\wedge} x1 x2 x3 + \\
& \quad \text{Cb} H- 1512.1065349199998^{\wedge} + 0.19942607999999998^{\wedge} x1 x2 x3L \\
& \quad H H- 82.6702^{\wedge} + 0.050117^{\wedge} \text{Ntd} x1 x2L H1.83^{\wedge} + 1.22^{\wedge} \text{Ntd} + x3L + \\
& \quad H- 0.0918^{\wedge} + 0.8479^{\wedge} \text{Cb} L H- 148.6129^{\wedge} + 0.0196^{\wedge} x1 x2 x3L \\
& \quad H1.83^{\wedge} + H2.033333333333333^{\wedge} - 0.813333333333332^{\wedge} \text{Cb} L \\
& \quad \text{IntegerPart}0.4098360655737705^{\wedge} H- 1.83^{\wedge} + x3L \\
& H- 828.3304293599999^{\wedge} - 1512.1065349199998^{\wedge} \text{Cb} + 0.601404^{\wedge} \text{Ntd} x1 x2 - \\
& \quad 0.02159136^{\wedge} x1 x2 x3 + \\
& \quad 0.19942607999999998^{\wedge} \text{Cb} x1 x2 x3L - \\
& 0.00043983364370304626^{\wedge} - 435.41364296081287^{\wedge} Hx1 x2 x3L^{0.724^{\wedge}} - \\
& 40.083164870667126^{\wedge} Hx1 x2 x3L^{1.003^{\wedge}} - \\
& 0.01842450571162964^{\wedge} \text{Cb} \\
& \int 1077.5862068965514^{\wedge} + 1.^{\wedge} J- 8.3^{\wedge} + \frac{x1}{x3} \frac{1.691^{\wedge}}{x3} \\
& Hx1 x2 x3L^{1.003^{\wedge}} - \\
& 0.037197176999979084^{\wedge} J- 8.3^{\wedge} + \frac{x1}{x3} \frac{1.691^{\wedge}}{x3} Hx1 x2 x3L^{1.003^{\wedge}} + \\
& x3^{\wedge} - 1458.6357039187228^{\wedge} Hx1 x2 x3L^{0.724^{\wedge}} + \\
& 1.^{\wedge} x1 Hx1 x2 x3L^{0.724^{\wedge}} - 64.64612830341193^{\wedge} Hx1 x2 x3L^{1.003^{\wedge}} + \\
& 0.00010854318961127322^{\wedge} \text{Cb} \int - 295002.5735002021^{\wedge} - \\
& 273.76238820818764^{\wedge} J- 8.3^{\wedge} + \frac{x1}{x3} \frac{1.691^{\wedge}}{x3} + 1077.5862068965519^{\wedge} \\
& \frac{x1}{x3} \frac{2^{\wedge}}{x3} + 1.^{\wedge} J- 8.3^{\wedge} + \frac{x1}{x3} \frac{1.691^{\wedge}}{x3} \int \frac{x1}{x3} \frac{2^{\wedge}}{x3} Hx1 x2 x3L^{1.003^{\wedge}} - \\
& 0.05999160706556627^{\wedge} J- 8.3^{\wedge} + \frac{x1}{x3} \frac{1.691^{\wedge}}{x3} Hx1 x2 x3L^{1.003^{\wedge}} - \\
& 0.17171627830593794^{\wedge} \int \frac{x1}{x3} \frac{2^{\wedge}}{x3} Hx1 x2 x3L^{1.003^{\wedge}} + \\
& 0.00009285950878661341^{\wedge} \text{Cb}^2 \int 1077.5862068965514^{\wedge} + \\
& 1.^{\wedge} J- 8.3^{\wedge} + \frac{x1}{x3} \frac{1.691^{\wedge}}{x3} \int \frac{x1}{x3} \frac{2^{\wedge}}{x3} Hx1 x2 x3L^{1.003^{\wedge}} - \\
& 0.00015935270626791042^{\wedge} J- 8.3^{\wedge} + \frac{x1}{x3} \frac{1.691^{\wedge}}{x3} \int \frac{x1}{x3} \frac{2^{\wedge}}{x3}
\end{aligned}$$

$$\begin{aligned}
& 0.03969110399999999 \cdot x^{5^2} \cdot \text{MM}^{\wedge 3} \\
& 13.779184373405185 \cdot 1 \cdot \text{Ix}^5 \cdot \text{I} \cdot \text{I} - 2.45175 \cdot \\
& \quad \bullet \text{ABT} - 9.807 \cdot \text{hb} + 9.807 \cdot x^4 + \\
& \quad 0.03969110399999999 \cdot x^{5^2} \cdot \text{MM}^{\wedge 2} \cdot \text{M} + \\
& 10.1797758983999999 \cdot 0.93 \cdot + \text{H1} \cdot - \text{Cpl}^{0.60247} \\
& 0.487118 \cdot \text{H1} \cdot + 0.011 \cdot \text{CsternL} \\
& 1 \cdot - \text{Cp} + \text{J} \cdot x^2 \cdot 1.06806 \\
& \quad \text{C} \cdot x^{1.2} \cdot \text{C} \cdot x^4 \cdot \text{J} \cdot x^4 \cdot 0.46106 \cdot \text{J} \cdot 2.38 \cdot \text{ABT} + \\
& \quad \text{Cm} \cdot x^1 \cdot \text{J} \cdot 0.453 \cdot + 0.4425 \cdot \text{Cb} - 0.2862 \cdot \text{Cm} + \\
& 0.3696 \cdot \text{Cw} - \frac{0.003467 \cdot x^2}{x^4} \cdot \text{Hx}^2 + 2 \cdot x^4 \cdot \text{LN} \cdot x^{5^2} \\
& \text{H}3.6363748627922092 \cdot + 0.43429448190325176 \cdot \\
& \text{Log} \cdot x^1 \cdot x^{5 \cdot \text{DL}^{\wedge 2}} \cdot \text{V}^{\wedge 0.775} \cdot \text{V} - 0.7891027340185741 \cdot \\
& x^5 \cdot - \text{Cm} \cdot \text{H}90 \cdot - \text{hal}^{1.3/565} \cdot 1.78933298360292 \cdot *^{\wedge 10} \cdot c^{7^{3.78613}} \cdot \text{Cb} \\
& \tilde{a}^{\wedge 3} - 1.41434649220055 \cdot \& \cdot \frac{\text{ABT}^{1.5}}{\text{hb} - x^4 - \text{ABT} \cdot x^2 \cdot x^4} - \\
& \frac{5.081833302662383 \cdot c^{16}}{\text{I} \cdot x^1 \cdot 0.9} - \frac{24.358395841320416 \cdot x^2}{x^1 \cdot \text{I} \cdot x^1 \cdot 0.9} + \\
& \frac{0.07135249685269171 \cdot x^1}{x^4 \cdot \text{I} \cdot x^1 \cdot 0.9} - \\
& \frac{8.906116136247933 \cdot \text{Cb} \cdot x^2 \cdot x^4}{\text{HCb} \cdot x^1 \cdot x^2 \cdot x^4 \cdot 0.666666666666667 \cdot \text{I} \cdot x^1 \cdot 0.9} + \\
& 0 \cdot \tilde{a} \cdot \frac{12.65314114555665}{x^1 \cdot 0.9} \cdot \text{Cos} \cdot \text{B}
\end{aligned}$$

$$\begin{aligned}
& -13.34248601399447^{\wedge} + 53.59231882287779^{\wedge} \text{Cp} \\
& x1 \text{J} \frac{x4}{x2}^{1.07961} \text{H1.}^{\wedge} \text{AT} - 1.25^{\wedge} \text{Cm} x2 x4 \text{L} + \\
135.730345312^{\wedge} \text{AT} c6 x5^{2.} + 135.730345312^{\wedge} \\
& -0.00205^{\wedge} - 0.0010954451150103322^{\wedge} \text{H} - 0.04^{\wedge} + 1.^{\wedge} c4 \text{L} \text{Cb}^{4.} \\
& \bar{a}^{-1.41434649220055^{\wedge} \$ \frac{\text{ABT}^{1.5}}{\text{hb} - x4 - \text{ABT} x2 x4}} \cdot \frac{\text{H1.}^{\wedge}}{x1} + \frac{0.006^{\wedge}}{\text{H}100.^{\wedge} + x1 \text{L}^{0.16}} \\
& \text{J} \frac{2.38^{\wedge} \text{ABT}}{\text{Cb}} + \frac{\text{H1.}^{\wedge}}{\text{Cm}} x1 \text{J} 0.453^{\wedge} + 0.4425^{\wedge} \text{Cb} - 0.2862^{\wedge} \text{Cm} + \\
& 0.3696^{\wedge} \text{Cw} - \frac{0.003467^{\wedge} x2}{x4} \text{H} x2 + 2.^{\wedge} x4 \text{L} \\
& x5^{2.} + 569.2916975592^{\wedge} \text{ABT}^{1.5} \bar{a}^{-\frac{0.566326570612241^{\wedge}}{\text{ABT}^{1.5} \text{hb} - x4}} \\
& \text{I} x5^{\wedge} \text{I} - 2.45175^{\wedge} \cdot \frac{\text{H1.}^{\wedge}}{\text{ABT}} - 9.807^{\wedge} \text{hb} + 9.807^{\wedge} x4 + \\
& 0.03969110399999999^{\wedge} x5^{2.} \text{MM}^{\wedge} 3. \\
13.779184373405185^{\wedge} + 1.^{\wedge} \text{I} x5^{\wedge} \text{I} - 2.45175^{\wedge} \cdot \frac{\text{H1.}^{\wedge}}{\text{ABT}} - 9.807^{\wedge} \text{hb} + \\
& 9.807^{\wedge} x4 + 0.03969110399999999^{\wedge} x5^{2.} \text{MM}^{\wedge} 2. \\
10.179775898399999^{\wedge} 0.93^{\wedge} + \frac{\text{H1.}^{\wedge} - \text{Cpl}^{0.60247}}{\text{H1.}^{\wedge} - \text{Cp} + \frac{\text{H1.}^{\wedge}}{-1. + 4. \text{Cp}}} 0.487118^{\wedge} \\
& \text{H1.}^{\wedge} + 0.011^{\wedge} \text{CsternL} \frac{\text{H1.}^{\wedge}}{\text{I.}^{\wedge} - \text{Cp} + \frac{\text{H1.}^{\wedge}}{-1. + 4. \text{Cp}}} 0.121563^{\wedge} \\
& \text{J} \frac{x2}{x1}^{1.06806} \text{J} \frac{x1^{2.}}{\text{Cb} x2 x4}^{0.36486} \text{J} \frac{x4}{x1}^{0.46106} \\
& \text{J} \frac{2.38^{\wedge} \text{ABT}}{\text{Cb}} + \frac{\text{H1.}^{\wedge}}{\text{Cm}} x1 \text{J} 0.453^{\wedge} + 0.4425^{\wedge} \text{Cb} - 0.2862^{\wedge} \text{Cm} + \\
& 0.3696^{\wedge} \text{Cw} - \frac{0.003467^{\wedge} x2}{x4} \text{H} x2 + 2.^{\wedge} x4 \text{L} x5^{2.} \\
& \text{H} 3.6363748627922092^{\wedge} + 0.43429448190325176^{\wedge} \\
& \text{Log} @ x1 x5 \text{L}^{\wedge} 2. \frac{\text{H1.}^{\wedge}}{\text{I.}^{\wedge}}^{0.775} +
\end{aligned}$$

$$3.090765690163143 \cdot 10^{-10} \sqrt{90} \cdot \text{hal}^{1.37565} \sqrt{2.2366662295036503 \cdot 10^{10}}$$

$$c^{7.78613} \text{Cb} \bar{a}^{\wedge} - 1.41434649220055$$

$$\& \sqrt{\text{ABT}^{1.5}} + \sqrt{\text{hb} - x4 - \text{ABT} x2 x4} \sqrt{x1^{1.9}}$$

$$\sqrt{5.081833302662383} \sqrt{-c16 - \frac{4.79323 x2}{x1} + \frac{0.0140407 x1}{x4}}$$

$$\sqrt{1.75254 \text{Cb} x2 x4} \sqrt{\text{Hcb} x1 x2 x4^{0.6666666666666667} \frac{w}{\{}} + 0 \cdot \bar{a} \sqrt{\frac{13.05216110505605}{x1 \{}}$$

$$\text{CosB} \sqrt{-13.34248601399447 + 53.59231882287779 \text{Cp}} \sqrt{x1}$$

$$x1 x2 J1 \cdot - \frac{0.8 \text{AT}}{\text{Cm} x2 x4} x4 J \frac{x4}{x2} \sqrt{1.07961}$$

$$135.730345312 \text{AT} c6 x5^{2.} + 135.730345312$$

$$\sqrt{-0.00205} - 0.0010954451150103322 \text{H} - 0.04 + 1 \cdot c4 \text{Cb}^4$$

$$\bar{a}^{-1.41434649220055} \sqrt{\text{ABT}^{1.5}} \sqrt{\text{hb} - x4 - \text{ABT} x2 x4} \sqrt{x1} + \frac{0.006}{\text{H}100. + x1^{1.16}}$$

$$J \frac{2.38 \text{ABT}}{\text{Cb}} + \sqrt{\text{Cm} x1} J0.453 + 0.4425 \text{Cb} - 0.2862 \text{Cm} +$$

$$0.3696 \text{Cw} - \frac{0.003467 x2}{x4} \text{H} x2 + 2 \cdot x4 \text{LN} x5^{2.} +$$

$$\sqrt{569.2916975592 \text{ABT}^{1.5} \bar{a}} \sqrt{\frac{-0.566226620012246}{x1 \{}} \sqrt{x5' |' | - 2.45175} \cdot \sqrt{\text{ABT} -$$

$$9.807 \text{hb} + 9.807 x4 + 0.03969110399999999 x5^{2.} \sqrt{\text{MM}^3}$$

$$13.779184373405185 + 1 \cdot |x5' |' | - 2.45175 \cdot \sqrt{\text{ABT} - 9.807 \text{hb} + 9.807 x4 + 0.03969110399999999 x5^{2.} \sqrt{\text{MM}^2} \cdot \text{M} +$$

$$\sqrt{10.179775898399999} \sqrt{0.93} + \sqrt{\text{H}1. - \text{Cpl}^{0.60247}} \sqrt{0.487118}$$

$$\text{H}1. + 0.011 \text{CsternL} \sqrt{1. - \text{Cp} + \frac{0.121563}{-1. + 4. \text{Cp}}}$$

$$\begin{aligned}
& \left(\frac{1.06806}{x^2} \right) \left(\frac{0.36486}{x^2} \right) \left(\frac{0.46106}{x^4} \right) \\
& \frac{2.38}{C_b} \text{ABT} + \frac{0.003467}{x^4} x^2 \\
& 0.3696 C_w - \frac{0.003467}{x^4} H x^2 + 2. x^4 L x^5 \\
& H 3.6363748627922092 + 0.43429448190325176 \text{Log} x^1 x^5 L^2
\end{aligned}$$

$$40896.14657063999 + 0.601404 \text{Ntd} x^1 x^2 -$$

$$0.02159136$$

$$x^1$$

$$x^2$$

$$x^3 + C_b$$

$$H - 1512.1065349199998 +$$

$$0.19942607999999998 x^1 x^2 x^3 L +$$

$$1.03 \left(0.6197720682895518 H x^1 x^2 x^3 L^{0.724} +
\right.$$

$$0.05705477170296265 H^1 + 0.49532 C_b L$$

$$\left(1. + 0.000928 J - 8.3 + \frac{1.691}{x^3} \right)$$

$$H x^1 x^2 x^3 L^{1.003} + 0.0011232166043994344$$

$$\left(H^90 - \text{hal}^{1.57565} \right) 2.2366662295036503 * 10^7 3.78613 C_b$$

$$\bar{a}^{\wedge} - 1.41434649220055 \& \frac{\text{ABT}^{1.5}}{h b - x^4 - \text{ABT} x^2 x^4} +$$

$$\left(5.081833302662383 \right) - c 16 - \frac{4.79323 x^2}{x^1} +$$

$$\frac{0.0140407 x^1}{x^4} - \frac{1.75254 C_b x^2 x^4}{H C_b x^1 x^2 x^4 L^{0.6666666666666667}}$$

$$0. \bar{a} \left(\frac{-12.953161110805605}{x^1} \right) \text{Cos} B$$

$$-13.34248601399447 + 53.59231882287779 C_p$$

$$\begin{aligned}
& x^1 x^2 J^1 - \frac{0.8 \text{ AT}}{C_m x^2 x^4} x^4 J^1 + \frac{1.07961 \sqrt{}}{x^2} + \\
& 135.730345312 \text{ AT} c^6 x^5^{2.} + 135.730345312 \sqrt{} \\
& -0.00205 \sqrt{} - 0.0010954451150103322 \sqrt{} H - 0.04 \sqrt{} + 1. \sqrt{} c^4 L C b^4 \sqrt{} \\
& \bar{a}^{-1.41434649220055 \sqrt{} \frac{0.006 \sqrt{}}{H^{100.} + x^{11} 0.16 \sqrt{}}} + \frac{0.006 \sqrt{}}{H^{100.} + x^{11} 0.16 \sqrt{}} \\
& \frac{2.38 \sqrt{} \text{ ABT}}{C_b} + \frac{0.003467 \sqrt{} x^2}{x^4} x^1 J 0.453 \sqrt{} + 0.4425 \sqrt{} C_b - 0.2862 \sqrt{} C_m + \\
& 0.3696 \sqrt{} C_w - \frac{0.003467 \sqrt{} x^2}{x^4} H x^2 + 2. \sqrt{} x^4 L N \\
& x^5^{2.} + 569.2916975592 \sqrt{} \text{ ABT}^{1.5} \bar{a} \sqrt{} \\
& l x^5 \sqrt{} l' l - 2.45175 \sqrt{} \text{ ABT} - 9.807 \sqrt{} h b + 9.807 \sqrt{} x^4 + \\
& 0.03969110399999999 \sqrt{} x^5^{2.} \sqrt{}^3 \sqrt{} \\
& 13.779184373405185 \sqrt{} + 1. \sqrt{} l x^5 \sqrt{} l' l - 2.45175 \sqrt{} \text{ ABT} - 9.807 \sqrt{} h b + \\
& 9.807 \sqrt{} x^4 + 0.03969110399999999 \sqrt{} x^5^{2.} \sqrt{}^2 \sqrt{} + \\
& 10.179775898399999 \sqrt{} 0.93 \sqrt{} + \frac{0.487118 \sqrt{}}{H^1 - C p L^{0.60247} \sqrt{}} \\
& H^1 \sqrt{} + 0.011 \sqrt{} C^{\text{stern}} \sqrt{} \frac{0.121563 \sqrt{}}{1. \sqrt{} - C_p + \sqrt{}} \\
& J^2 \frac{1.06806 \sqrt{}}{x^1} \sqrt{} \frac{x^1 2. \sqrt{}}{C_b x^2 x^4} \sqrt{} \frac{0.36486 \sqrt{}}{x^1} \sqrt{} \frac{0.46106 \sqrt{}}{x^1} \sqrt{} \\
& \frac{2.38 \sqrt{} \text{ ABT}}{C_b} + \frac{0.003467 \sqrt{} x^2}{x^4} x^1 J 0.453 \sqrt{} + 0.4425 \sqrt{} C_b - 0.2862 \sqrt{} C_m + \\
& 0.3696 \sqrt{} C_w - \frac{0.003467 \sqrt{} x^2}{x^4} H x^2 + 2. \sqrt{} x^4 L N x^5^{2.} \sqrt{} \\
& H 3.6363748627922092 \sqrt{} + 0.43429448190325176 \sqrt{} \\
& \text{Log} @ x^1 x^5 D L^2 \sqrt{} \sqrt{}^{0.775} \sqrt{} + \\
& 0.00041414026809651473 \sqrt{} \frac{2.2366662295036503 \sqrt{} * 10 c^7 3.78613 \sqrt{}}{H^9 0. \sqrt{} - h a l^{1.37565} \sqrt{}}
\end{aligned}$$

$$\begin{aligned}
& Cb \bar{a}^k - 1.41434649220055 \cdot \frac{ABT^{1.5}}{hb - x^4 - ABT x^2 x^4} + \frac{1}{x^1} \\
& \int_k 5.081833302662383 \int_k -c16 - \frac{4.79323 \cdot x^2}{x^1} + \frac{0.0140407 \cdot x^1}{x^4} - \\
& \frac{1.75254 \cdot Cb x^2 x^4}{HCb x^1 x^2 x^4} + 0 \cdot \bar{a} \\
& CosB = \frac{-13.34248601399447 + 53.59231882287779 \cdot Cp}{x^1} \\
& x^2 J1 \cdot - \frac{0.8 \cdot AT}{Cm x^2 x^4} + \frac{1.07961 \cdot J}{x^2} + 135.730345312 \cdot AT c6 x5^{2 \cdot} + \\
& 135.730345312 \cdot -0.00205 \cdot -0.0010954451150103322 \cdot H - 0.04 \cdot + 1 \cdot c4L \\
& Cb^4 \cdot \bar{a} - 1.41434649220055 \cdot \frac{ABT^{1.5}}{hb - x^4 - ABT x^2 x^4} \cdot \frac{1}{x^1} + \frac{0.006}{H100 \cdot + x1L^{0.16}} \\
& J \frac{2.38 \cdot ABT}{Cb} + \frac{1}{Cm} x^1 J0.453 \cdot + 0.4425 \cdot Cb - 0.2862 \cdot Cm + \\
& 0.3696 \cdot Cw - \frac{0.003467 \cdot x^2}{x^4} Hx2 + 2 \cdot x4LN x5^{2 \cdot} + \\
& 569.2916975592 \cdot ABT^{1.5} \bar{a} \cdot \frac{1}{x^5} \cdot | \cdot -2.45175 \cdot \frac{1}{ABT} - \\
& 9.807 \cdot hb + 9.807 \cdot x^4 + 0.03969110399999999 \cdot x5^{2 \cdot} \\
& 13.779184373405185 \cdot + 1 \cdot |x5 \cdot | \cdot | -2.45175 \cdot \frac{1}{ABT} - 9.807 \cdot hb + \\
& 9.807 \cdot x^4 + 0.03969110399999999 \cdot x5^{2 \cdot} \\
& 10.179775898399999 \cdot 0.93 \cdot + \frac{1}{H1 \cdot - Cpl} \cdot 0.487118 \cdot \\
& H1 \cdot + 0.011 \cdot Csternl \cdot \frac{1}{1 \cdot - Cp + \frac{1}{-1 \cdot +4 \cdot Cp}} \\
& J \frac{x^2}{x^1} \cdot \frac{1.06806}{x^1} \cdot \frac{x^1 \cdot 2 \cdot}{Cb x^2 x^4} \cdot \frac{0.36486}{x^1} \cdot \frac{0.46106}{x^1} \\
& J \frac{2.38 \cdot ABT}{Cb} + \frac{1}{Cm} x^1 J0.453 \cdot + 0.4425 \cdot Cb - 0.2862 \cdot Cm + \\
& 0.3696 \cdot Cw - \frac{0.003467 \cdot x^2}{x^4} Hx2 + 2 \cdot x4LN x5^{2 \cdot}
\end{aligned}$$

$$0.6363748627922092 + 0.43429448190325176 \log_{10} x^{2.0000000000000000}$$

Appendix E

Mathematical Form of the Return on Investment

ROI =

$$\begin{aligned}
 & -1.4 \cdot 6 - 100 \cdot S_s - 381726.88603230263 \cdot Hx1 \ x2 \ x3L^{0.16666666666666666} - \\
 & 71101.39797224934 \cdot Hx1 \ x2 \ x3L^{0.54299999999999999} - 20721.61586909756 \cdot Hx1 \ x2 \ x3L^{0.6516} - \\
 & 16128.36417412454 \cdot Hx1 \ x2 \ x3L^{0.724} - 368.6194233428627 \cdot Hx1 \ x2 \ x3L^{1.003} - \\
 & 0.34207882486217667 \cdot J - 8.3 + \frac{x1}{x3} \cdot Hx1 \ x2 \ x3L^{1.003} - \\
 & 362.23587808118253 \cdot \frac{J}{K} \cdot 1 + 0.000928 \cdot J - 8.3 + \frac{x1}{x3} \cdot Hx1 \ x2 \ x3L^{1.003} \cdot \frac{0.85}{K} + \\
 & x5 \cdot -1.0500811611320248 \cdot 9 + \frac{1}{H90} - \text{hal}^{1.37565} \\
 & \bar{a}^k - 28.836809873393417 \cdot \$ \frac{1}{-5.7 + x4 + 7.463243262818116 \cdot x2 \ x4} - \\
 & \frac{6 \ 387672141474464}{x1} - \frac{24 \ 358395841320416 \cdot x2}{x1} - \\
 & \frac{7 \ 875638056004192 \cdot x2 \ x4}{Hx1 \ x2 \ x4L^{0.6666666666666667}} \cdot \frac{1}{x1} \cdot x1^2 \cdot 17634.127526400003 \cdot \bar{a}^k \\
 & 28.836809873393417 \cdot \$ \frac{1}{-5.7 + x4 + 7.463243262818116 \cdot x2 \ x4} + \\
 & \frac{6 \ 387672141474464}{x1} + \frac{24 \ 358395841320416 \cdot x2}{x1} + \\
 & \frac{7 \ 875638056004192 \cdot x2 \ x4}{Hx1 \ x2 \ x4L^{0.6666666666666667}} \cdot \frac{1}{x1} \cdot \text{hal}^{1.37565}
 \end{aligned}$$

$$H1 \cdot Ntd \ x2 + 0.19318513018584127 \cdot x2 \ x3L - 3.353825505708245 \cdot *^{\wedge}11$$

$$c7^{3.78613} \cdot \bar{a} \left[\frac{0.07135249685269171 \cdot x1}{x4} + 0 \cdot \bar{a} \right] \cdot \cos \left[\frac{24.150700234490834}{x1} \right]$$

$$\frac{x4^{1.07961}}{x2} \cdot H - 334.27762039660064 \cdot + 1 \cdot x2 \ x4L +$$

$$9.802448850520182 \cdot *^{\wedge}7 \bar{a} \cdot \left[\frac{-0.1717473344813688}{x4} \right] \cdot |x5 \cdot |' \ H - 74.19790666961431 \cdot +$$

$$9.807 \cdot x4 + 0.03969110399999999 \cdot x5^{2.2} \cdot \text{LIM}^{\wedge} 3 \cdot \text{''}$$

$$| - 3.779184373405185 \cdot - 1 \cdot |x5 \cdot |' \ H - 74.19790666961431 \cdot + 9.807 \cdot x4 + 0.03969110399999999 \cdot x5^{2.2} \cdot \text{LIM}^{\wedge} 2 \cdot \text{''} +$$

$$x1 \cdot - 5.4973453844257735 \cdot *^{\wedge}7 + 336840.1257984 \cdot Ntd \ x2 + 65072.50355417907 \cdot$$

$$x2 \ x3 + \frac{2.1414976827407598 \cdot *^{\wedge}15 \ c7^{3.78613} \cdot \bar{a}^{\wedge}}{H90 \cdot - \text{hal}^{1.37565}}$$

$$- 28.836809873393417 \cdot \$ \cdot - 5.7 \cdot + x4 + 7.463243262818116 \cdot x2 \ x4$$

$$\frac{6.387672141474464 \cdot}{|x1|^{0.9}} - \frac{24.358395841320416 \cdot x2}{x1 \cdot |x1|^{0.9}} +$$

$$\frac{0.07135249685269171 \cdot x1}{x4 \cdot |x1|^{0.9}} - \frac{7.875638056004192 \cdot x2 \ x4}{Hx1 \ x2 \ x4L^{0.666666666666667} \cdot |x1|^{0.9}} +$$

$$0 \cdot \bar{a} \cdot \cos \left[\frac{24.150700234490834}{x1} \right] \cdot \frac{x4^{1.07961}}{x2}$$

$$\frac{6.406344762775322 \cdot *^{\wedge}12 \ c7^{3.78613} \cdot \bar{a}^{\wedge}}{H90 \cdot - \text{hal}^{1.37565}}$$

$$- 28.836809873393417 \cdot \$ \cdot - 5.7 \cdot + x4 + 7.463243262818116 \cdot x2 \ x4$$

$$\frac{6.387672141474464 \cdot}{|x1|^{0.9}} - \frac{24.358395841320416 \cdot x2}{x1 \cdot |x1|^{0.9}} +$$

$$\frac{0.07135249685269171 \cdot x1}{x4 \cdot |x1|^{0.9}} - \frac{7.875638056004192 \cdot x2 \ x4}{Hx1 \ x2 \ x4L^{0.666666666666667} \cdot |x1|^{0.9}} +$$

$$0. \bar{a} \left(\frac{24.150700234490834}{x^2} \right) \cos B \left(\frac{1.07961}{x^2} \right) +$$

$$5.13174113955004 \cdot x^6 \bar{a} \left(\frac{1}{x^4} \right) |x^5 \cdot l' \bar{H} - 74.19790666961431 \cdot +$$

$$9.807 \cdot x^4 + 0.03969110399999999 \cdot x^5 \cdot \text{LMM}^3 \cdot +$$

$$l - 3.779184373405185 \cdot - 1. \cdot |x^5 \cdot l' \bar{H} - 74.19790666961431 \cdot +$$

$$9.807 \cdot x^4 + 0.03969110399999999 \cdot x^5 \cdot \text{LMM}^2 \cdot +$$

$$H104.1833333333332 \cdot + 0.28061479207009726 \cdot x^5 + x^1 H5.454166666666667 \cdot +$$

$$H0.0374 \cdot + 0.0001392138888888889 \cdot \text{Ntd} \cdot x^2 +$$

$$0.00002692402183333333 \cdot x^2 \cdot x^3 \cdot x^5 \cdot \text{L} -$$

$$2.0490723418240729 \cdot x^6 \cdot 2.2604108721379874 \cdot Hx^1 \cdot x^2 \cdot x^3 \cdot \text{L}^{0.16666666666666666} \cdot +$$

$$0.5373968269457794 \cdot x^5 \cdot H90 \cdot - \text{hal}^{1.3/565}$$

$$1.5466546977017742 \cdot x^{10} \cdot c^{7^{3.78613}} \cdot \bar{a} \cdot \bar{A}^3 - 28.836809873393417 \cdot$$

$$-5.7 \cdot + x^4 + 7.463243262818116 \cdot x^2 \cdot x^4$$

$$\frac{6.387672141474464}{x^1} - \frac{24.358395841320416 \cdot x^2}{x^1} +$$

$$\frac{0.07135249685269171 \cdot x^1}{x^4} -$$

$$\frac{7.875638056004192 \cdot x^2 \cdot x^4}{Hx^1 \cdot x^2 \cdot x^4 \cdot \text{L}^{0.6666666666666667}} +$$

$$0. \bar{a} \left(\frac{24.150700234490834}{x^2} \right) \cos B \left(\frac{1.07961}{x^2} \right) +$$

$$x^1 \cdot \frac{x^4}{x^2} \cdot \text{L}^{1.07961} \cdot H - 334.27762039660064 \cdot + 1. \cdot x^2 \cdot x^4 \cdot +$$

$$56056.632613855996 \cdot c^6 \cdot x^5 \cdot \text{L}^2 \cdot + 135.730345312 \cdot - 0.00205 \cdot +$$

$$H0.000010018884088099185 \cdot - 0.0002504721022024796 \cdot c^4 \cdot \text{L}$$

$$\begin{aligned}
& a^{-28.836809873393417} \cdot \frac{1}{x^1} + \\
& \frac{0.006}{100} + x^{1.016} \cdot 191.70788141720897 + \\
& x^{1.07472141154913118} x^2 - \frac{0.0034468327443611183 x^2}{x^4} + \\
& 1.5082155619600681 x^4 x^5 + \\
& 236656.06714975525 a^{-0.1717473314813688} x^5 - 74.19790666961431 + \\
& 9.807 x^4 + 0.03969110399999999 x^5 \text{LIM}^3 + \\
& 13.779184373405185 + 1 x^5 - 74.19790666961431 + \\
& 9.807 x^4 + 0.03969110399999999 x^5 \text{LIM}^2 + \\
& 10.179775898399999 \cdot 0.93 + 1.1501585856866496 \\
& \frac{0.3004 + 0.00014938078291814948 x^1}{x^1} \frac{0.121563 x^2}{x^1} \frac{1.06806}{x^1} \\
& \frac{x^{1.2}}{x^2 x^4} \frac{0.36486 x^4}{x^1} \frac{0.46106}{x^1} 191.70788141720897 + \\
& x^{1.07472141154913118} x^2 - \frac{0.0034468327443611183 x^2}{x^4} + \\
& 1.5082155619600681 x^4 x^5 + \\
& 13.6363748627922092 + 0.43429448190325176 \text{Log} x^1 x^5 \text{LIM}^2 \wedge 0.2 \\
& 0.56 - 4.518765561507924 \cdot 2.2604108721379874 x^1 x^2 x^3 \text{LIM}^{0.16666666666666666666} + \\
& 0.5373968269457794 \\
& x^5 \cdot \frac{1.5466546977017742 \cdot 10}{x^1} \\
& c^{7.78613} a^{-28.836809873393417} \\
& -5.7 + x^4 + 7.463243262818116 x^2 x^4 \\
& \frac{6.387672141474464}{x^1} - \frac{24.358395841320416 x^2}{x^1}
\end{aligned}$$

$$\begin{aligned}
& \bar{a}^k - 28.836809873393417 \cdot \left(-5.7^x + x^4 + 7.463243262818116 \cdot x^2 \cdot x^4 \right) \\
& \frac{6.387672141474464}{x^1} - \frac{24.358395841320416 \cdot x^2}{x^1} + \\
& \frac{0.07135249685269171 \cdot x^1}{x^4} - \frac{7.875638056004192 \cdot x^2 \cdot x^4}{x^1 \cdot x^2 \cdot x^4} + \\
& 0 \cdot \bar{a} \cdot \cos \left(\frac{24.150700234490834}{x^1} \right) \\
& x^1 \cdot \frac{x^4}{x^2} \cdot 1.07961 \cdot \left(-334.27762039660064 + 1 \cdot x^2 \cdot x^4 \right) + \\
& 56056.632613855996 \cdot c_6 \cdot x^{5^2} + 135.730345312 \cdot \\
& \int_k -0.00205^x + 10.000010018884088099185^x - 0.0002504721022024796 \cdot c_{4L} \\
& \bar{a}^{-28.836809873393417} \cdot \left(-5.7^x + x^4 + 7.463243262818116 \cdot x^2 \cdot x^4 \right) \cdot \frac{0.006^x}{x^1} + \frac{0.006^x}{100 \cdot x^1 \cdot 0.16^x} \\
& \int_k 191.70788141720897^x + x^1 \int_k 0.7472141154913118^x \cdot x^2 - \\
& \frac{0.0034468327443611183 \cdot x^2}{x^4} + 1.5082155619600681 \cdot x^4 \cdot x^{5^2} + \\
& \int_k 236656.06714975525^x \cdot \bar{a} \cdot \left(-8.55^x + x^4 \right) \cdot |x^5 \cdot l' \cdot H - 74.19790666961431^x + \\
& 9.807^x \cdot x^4 + 0.03969110399999999^x \cdot x^{5^2} \cdot \text{LIM}^3 \cdot \bar{a} \\
& 13.779184373405185^x + 1 \cdot |x^5 \cdot l' \cdot H - 74.19790666961431^x + 9.807^x \cdot x^4 + \\
& 0.03969110399999999^x \cdot x^{5^2} \cdot \text{LIM}^2 \cdot \bar{a} + \\
& \int_k 10.179775898399999^x \int_k 0.93^x + 1.1501585856866496^x \\
& \int_k \frac{0.3004^x + 0.00014938078291814948 \cdot x^1}{0.121563^x} \\
& \int_k \frac{x^2}{x^1} \cdot 1.06806^x \int_k \frac{x^2}{x^2 \cdot x^4} \cdot 0.36486^x \int_k \frac{x^4}{x^1} \cdot 0.46106^x \\
& \int_k 191.70788141720897^x + x^1 \int_k 0.7472141154913118^x \cdot x^2 - \\
& \frac{0.0034468327443611183 \cdot x^2}{x^4} + 1.5082155619600681 \cdot x^4 \cdot x^{5^2} \cdot \bar{a} \\
& H3.6363748627922092^x + 0.43429448190325176^x \cdot \text{Log} \otimes x^1 \cdot x^{5L^2} \cdot \bar{a}^{0.2} -
\end{aligned}$$

$$1105.3973652551122 \sqrt[k]{x^5} \sqrt[k]{100} - \sqrt[k]{1.5466546977017742 \cdot 10^7} x^{3.78613}$$

$$\sqrt[k]{a^4} - 28.836809873393417 \sqrt[k]{-5.7^2 + x^4 + 7.463243262818116^2 x^2 x^4}$$

$$\frac{6.387672141474464 \sqrt[k]{x^1}}{\sqrt[k]{x^1}} - \frac{24.358395841320416 \sqrt[k]{x^2}}{\sqrt[k]{x^1}}$$

$$\frac{0.07135249685269171 \sqrt[k]{x^1}}{x^4 \sqrt[k]{x^1}} - \frac{7.875638056004192 \sqrt[k]{x^2 x^4}}{H x^1 x^2 x^4}$$

$$0 \cdot \sqrt[k]{a} \sqrt[k]{\cos B} \sqrt[k]{24.150700234490834}$$

$$x^1 \sqrt[k]{x^4} \sqrt[k]{1.07961} H - 334.27762039660064 \sqrt[k]{x^2 x^4} + 1 \cdot \sqrt[k]{x^2 x^4}$$

$$56056.632613855996 \sqrt[k]{c^6 x^5} + 135.730345312 \sqrt[k]{c^4}$$

$$\sqrt[k]{-0.00205} + \sqrt[k]{10.000010018884088099185} - 0.0002504721022024796 \sqrt[k]{c^4}$$

$$\sqrt[k]{a} - 28.836809873393417 \sqrt[k]{-5.7^2 + x^4 + 7.463243262818116^2 x^2 x^4} \cdot \sqrt[k]{x^1} + \frac{0.006 \sqrt[k]{x^1}}{\sqrt[k]{100^2 + x^1}}$$

$$\sqrt[k]{191.70788141720897} + x^1 \sqrt[k]{0.7472141154913118^2 x^2}$$

$$\frac{0.0034468327443611183 \sqrt[k]{x^2}}{x^4} + 1.5082155619600681 \sqrt[k]{x^4} \sqrt[k]{x^5} + 1.5082155619600681 \sqrt[k]{x^4} \sqrt[k]{x^5}$$

$$\sqrt[k]{236656.06714975525} \sqrt[k]{a} \sqrt[k]{1x^5} \sqrt[k]{1} H - 74.19790666961431 \sqrt[k]{x^4}$$

$$9.807 \sqrt[k]{x^4} + 0.0396911039999999 \sqrt[k]{x^5} \sqrt[k]{L^3}$$

$$13.779184373405185 \sqrt[k]{x^5} + 1 \cdot \sqrt[k]{1x^5} \sqrt[k]{1} H - 74.19790666961431 \sqrt[k]{x^4} + 0.0396911039999999 \sqrt[k]{x^5} \sqrt[k]{L^2}$$

$$\sqrt[k]{10.179775898399999} \sqrt[k]{0.93} + 1.1501585856866496 \sqrt[k]{x^1}$$

$$\sqrt[k]{0.3004 + 0.00014938078291814948 \sqrt[k]{x^1}} \sqrt[k]{0.121563}$$

$$\sqrt[k]{x^2} \sqrt[k]{1.06806} \sqrt[k]{x^1} \sqrt[k]{x^2} \sqrt[k]{0.36486} \sqrt[k]{x^4} \sqrt[k]{0.46106}$$

$$\sqrt[k]{191.70788141720897} + x^1 \sqrt[k]{0.7472141154913118^2 x^2}$$

$$\frac{0.0034468327443611183 \sqrt[k]{x^2}}{x^4} + 1.5082155619600681 \sqrt[k]{x^4} \sqrt[k]{x^5} + 1.5082155619600681 \sqrt[k]{x^4} \sqrt[k]{x^5}$$

$$\begin{aligned}
& \text{H3.6363748627922092}^{\wedge} + 0.43429448190325176^{\wedge} \text{Log} \otimes x1 \text{ x50L}^{2.} \{ \} \wedge 0.6^{\wedge} + \\
& x5^{3.} \{ \} \text{K} 22094.68044196787^{\wedge} \cdot \text{H104.18333333333332}^{\wedge} + 0.28061479207009726^{\wedge} x5 + \\
& \quad x1 \text{H5.454166666666667}^{\wedge} + \text{H0.0374}^{\wedge} + 0.000139213888888889^{\wedge} \text{Ntd} x2 + \\
& \quad 0.00002692402183333333^{\wedge} x2 x3L x5LL + \\
& \text{Hc6H} - 2.3219023308707647^{\wedge} *^{\wedge} 7 - 1.2155535718724327^{\wedge} *^{\wedge} 6 x1LL \cdot \\
& \quad \text{H104.18333333333332}^{\wedge} + 0.28061479207009726^{\wedge} x5 + \\
& \quad x1 \text{H5.454166666666667}^{\wedge} + \text{H0.0374}^{\wedge} + 0.000139213888888889^{\wedge} \text{Ntd} x2 + \\
& \quad 0.00002692402183333333^{\wedge} x2 x3L x5LL - 64667.35739112547^{\wedge} \cdot \\
& \text{HH100.}^{\wedge} + x1L^{0.16} \text{H104.18333333333332}^{\wedge} + 0.28061479207009726^{\wedge} x5 + \\
& \quad x1 \text{H5.454166666666667}^{\wedge} + \text{H0.0374}^{\wedge} + 0.000139213888888889^{\wedge} \text{Ntd} x2 + \\
& \quad 0.00002692402183333333^{\wedge} x2 x3L x5LLL + \\
& \text{JH} - 775658.6682986249^{\wedge} + 1.9391466707465634^{\wedge} *^{\wedge} 7 c4L \\
& \quad \text{Jä}^{-28.836809873393417} \text{ } \cdot \text{XIN}^{\wedge} , \\
& \quad \text{H748368.816968294}^{\wedge} + 2015.7097421081667^{\wedge} x5 + \\
& \quad x1 \text{H39178.322724823905}^{\wedge} + \\
& \quad \text{H268.65135582736394}^{\wedge} + 1.^{\wedge} \text{Ntd} x2 + 0.19340040026338362^{\wedge} x2 x3L x5LL + \\
& \text{Jä}^{-28.836809873393417} \text{ } x1^{5 \cdot 2} \\
& \quad \text{HH0.7300978152007145}^{\wedge} - 18.252445380017864^{\wedge} c4L x2^2 + \\
& \quad \text{H} - 158.27266179359066^{\wedge} + 3956.8165448397667^{\wedge} c4L x2 x4 + \\
& \quad \text{H} - 319.46571484798403^{\wedge} + 7986.642871199604^{\wedge} c4L x4^2 \text{LN}^{\wedge} \\
& \quad \text{Hx4 H748368.816968294}^{\wedge} + 2015.7097421081667^{\wedge} x5 + x1 \text{H39178.322724823905}^{\wedge} + \\
& \quad \text{H268.65135582736394}^{\wedge} + 1.^{\wedge} \text{Ntd} x2 + 0.19340040026338362^{\wedge} x2 x3L x5LLL + \\
& \text{Jä}^{-28.836809873393417} \text{ } x1^{3 \cdot 2} \\
& \quad \text{HH13.946039550251086}^{\wedge} - 348.6509887562771^{\wedge} c4L x2^2 + \\
& \quad \text{H} - 3023.2617536187477^{\wedge} + 75581.5438404687^{\wedge} c4L x2 x4 + \\
& \quad x4 \text{H} - 40606.99075359544^{\wedge} - 6102.3076654385^{\wedge} x4 + c4 \\
& \quad \text{H1.01517476888398861}^{\wedge} *^{\wedge} 6 + 152557.6916359625^{\wedge} x4 \text{LLLL}^{\wedge} \\
& \quad \text{Hx4 H748368.816968294}^{\wedge} + 2015.7097421081667^{\wedge} x5 + x1 \text{H39178.322724823905}^{\wedge} + \\
& \quad \text{H268.65135582736394}^{\wedge} + 1.^{\wedge} \text{Ntd} x2 + 0.19340040026338362^{\wedge} x2 x3L x5LLL + \\
& \quad \int x1^2 \int x2^2 \int 149.38794660168824^{\wedge} - \frac{437.23301444396543^{\wedge}}{\text{H100.}^{\wedge} + x1L^{0.16}} - \\
& \quad \frac{5082.833792911098^{\wedge}}{\text{H3.6363748627922092}^{\wedge} + 0.43429448190325176^{\wedge} \text{Log} \otimes x1 \text{ x50L}^{2.} \{ \}} + \\
& \quad x2 x4 \int - 32384.740039288965^{\wedge} + \frac{94784.60499304089^{\wedge}}{\text{H100.}^{\wedge} + x1L^{0.16}} + \\
& \quad \frac{1.1018710330441^{\wedge} *^{\wedge} 6}{\text{H3.6363748627922092}^{\wedge} + 0.43429448190325176^{\wedge} \text{Log} \otimes x1 \text{ x50L}^{2.} \{ \}} + \\
& \quad x4^2 \int - 65367.031864984696^{\wedge} + \frac{191318.1420438576^{\wedge}}{\text{H100.}^{\wedge} + x1L^{0.16}} +
\end{aligned}$$

$$\begin{aligned}
& \frac{2.2240734012598447 \cdot 10^6}{H3.6363748627922092 + 0.43429448190325176 \cdot \text{Log}@x1 \cdot x5DL^2} \\
& Hx4 H-748368.816968294 - 2015.7097421081667 \cdot x5 + \\
& \quad x1 H-39178.322724823905 + H-268.65135582736394 - \\
& \quad 1. \cdot \text{Ntd} \cdot x2 - 0.19340040026338362 \cdot x2 \cdot x3L \cdot x5LLL + \\
& x1 \int_K \int_K x2^2 \int_K 2853.549439899628 - \frac{8351.852019218422}{H100. + x1L^{0.16}} - \\
& \frac{97090.27972341415}{H3.6363748627922092 + 0.43429448190325176 \cdot \text{Log}@x1 \cdot x5DL^2} \\
& Hx4 H-748368.816968294 - 2015.7097421081667 \cdot x5 + x1 \\
& \quad H-39178.322724823905 + H-268.65135582736394 - \\
& \quad 1. \cdot \text{Ntd} \cdot x2 - 0.19340040026338362 \cdot x2 \cdot x3L \cdot x5LLL + \\
& \int_K 8.30874280138159 \cdot 10^6 - \frac{2.431827161379977 \cdot 10^7}{H100. + x1L^{0.16}} + \\
& x4 \int_K 1.2486151755172478 \cdot 10^6 - \frac{3.654483440538285 \cdot 10^6}{H100. + x1L^{0.16}} - \\
& \frac{4.248336999625757 \cdot 10^7}{H3.6363748627922092 + 0.43429448190325176 \cdot \text{Log}@x1 \cdot x5DL^2} - \\
& \int_K 5.2540443817309946 \cdot 10^7 \\
& \int_K \frac{0.3004 + 0.00014938078291814948 \cdot x1^{0.121563}}{x1} \\
& \int_K \frac{x2^{1.06806}}{x1} \int_K \frac{x1^2 \cdot x2^{0.36486}}{x2 \cdot x4} \int_K \frac{x4^{0.46106}}{x1} \\
& H3.6363748627922092 + 0.43429448190325176 \cdot \text{Log}@x1 \cdot x5DL^2 - \\
& \frac{2.8269990751042235 \cdot 10^8}{H3.6363748627922092 + 0.43429448190325176 \cdot \text{Log}@x1 \cdot x5DL^2} - \\
& \int_K 3.496233610708968 \cdot 10^8 \int_K \frac{0.3004 + 0.00014938078291814948 \cdot x1^{0.121563}}{x1} \\
& \int_K \frac{x2^{1.06806}}{x1} \int_K \frac{x1^2 \cdot x2^{0.36486}}{x2 \cdot x4} \int_K \frac{x4^{0.46106}}{x1} \\
& H3.6363748627922092 + 0.43429448190325176 \cdot \text{Log}@x1 \cdot x5DL^2 - \\
& H748368.816968294 + 2015.7097421081667 \cdot x5 + \\
& \quad x1 H39178.322724823905 + H268.65135582736394 + \\
& \quad 1. \cdot \text{Ntd} \cdot x2 + 0.19340040026338362 \cdot x2 \cdot x3L \cdot x5LL + \\
& x2 \int_K \int_K 618600.4888788246 - \frac{1.8105380162307061 \cdot 10^6}{H100. + x1L^{0.16}} - \\
& \frac{2.1047504438681956 \cdot 10^7}{H3.6363748627922092 + 0.43429448190325176 \cdot \text{Log}@x1 \cdot x5DL^2} -
\end{aligned}$$

$$2.6030073050997764 \cdot x^7$$

$$\int \frac{1}{0.3004 + 0.00014938078291814948 x^1} dx$$

$$\int \frac{x^2}{x^1} dx \quad \int \frac{x^1}{x^2 x^4} dx \quad \int \frac{x^4}{x^1} dx \quad \int \frac{0.46106}{x^1} dx$$

$$H3.6363748627922092 + 0.43429448190325176 \cdot \text{Log} @ x^1 x5DL^2 -$$

$$2.7505775458670105 \cdot x^6$$

$$\int \frac{1}{0.3004 + 0.00014938078291814948 x^1} dx$$

$$\int \frac{x^2}{x^1} dx \quad \int \frac{0.0680600000000001 x^1}{x^2 x^4} dx \quad \int \frac{x^4}{x^1} dx \quad \int \frac{0.46106}{x^1} dx$$

$$H3.6363748627922092 + 0.43429448190325176 \cdot \text{Log} @ x^1 x5DL^2 -$$

$$H748368.816968294 + 2015.7097421081667 x^5 +$$

$$x^1 H39178.322724823905 + H268.65135582736394 +$$

$$1 \cdot \text{Ntd} x^2 + 0.19340040026338362 x^2 x3L x5LL -$$

$$751758.0296718335 \cdot H104.1833333333332 + 0.28061479207009726 x^5 +$$

$$x^1 H5.454166666666667 + H0.0374 + 0.000139213888888889 \cdot \text{Ntd} x^2 +$$

$$0.00002692402183333333 x^2 x3L x5LL$$

$$H3.6363748627922092 + 0.43429448190325176 \cdot \text{Log} @ x^1 x5DL^2 L -$$

$$\int \frac{1}{0.3004 + 0.00014938078291814948 x^1} dx$$

$$\int \frac{x^2}{x^1} dx \quad \int \frac{x^1}{x^2 x^4} dx \quad \int \frac{x^4}{x^1} dx \quad \int \frac{0.46106}{x^1} dx$$

$$H104.1833333333332 + 0.28061479207009726 x^5 +$$

$$x^1 H5.454166666666667 + H0.0374 + 0.000139213888888889 \cdot \text{Ntd} x^2 +$$

$$0.00002692402183333333 x^2 x3L x5LL$$

$$H3.6363748627922092 + 0.43429448190325176 \cdot \text{Log} @ x^1 x5DL^2 L -$$

$$\int \frac{1}{0.3004 + 0.00014938078291814948 x^1} dx$$

$$\int \frac{x^2}{x^1} dx \quad \int \frac{x^1}{x^2 x^4} dx \quad \int \frac{x^4}{x^1} dx \quad \int \frac{0.46106}{x^1} dx$$

$$H748368.816968294 + 2015.7097421081667 x^5 + x^1 H39178.322724823905 +$$

$$H268.65135582736394 + 1 \cdot \text{Ntd} x^2 + 0.19340040026338362 x^2 x3L x5LL$$

$$H3.6363748627922092 + 0.43429448190325176 \cdot \text{Log} @ x^1 x5DL^2 L +$$

$$\int \frac{1}{0.3004 + 0.00014938078291814948 x^1} dx$$

$$\begin{aligned}
& x^2 \int \frac{x^2}{x^2 x^4} dx + \int \frac{x^4}{x^1} dx \\
& x^4 \ln|x^2| + 2015.7097421081667 x^5 + \\
& x^1 \ln|39178.322724823905| + \ln|268.65135582736394| + \\
& 1. \operatorname{Ntd} x^2 + 0.19340040026338362 x^2 x^3 L x^5 L L \\
& \ln|3.6363748627922092| + 0.43429448190325176 \operatorname{Log} x^1 x^5 L^2 + \\
& \int \ln|120074.42882860563| dx + \int \frac{1}{0.3004 + 0.00014938078291814948 x^1} dx \\
& x^2 \int \frac{x^2}{x^1} dx + \int \frac{x^2}{x^2 x^4} dx + \int \frac{x^4}{x^1} dx \\
& \ln|x^4| \ln|748368.816968294| + 2015.7097421081667 x^5 + x^1 \ln|39178.322724823905| + \\
& \ln|268.65135582736394| + 1. \operatorname{Ntd} x^2 + 0.19340040026338362 x^2 x^3 L x^5 L L \\
& \ln|3.6363748627922092| + 0.43429448190325176 \operatorname{Log} x^1 x^5 L^2 + \dots
\end{aligned}$$

$$\int \ln|7379.218833668243| dx \ln|x^1 x^2 x^3 L^{0.5429999999999999}| +$$

$$2150.5813169097396^$$

$$\ln|x^1 x^2 x^3 L^{0.6516}| +$$

$$1625.7512793530145^$$

$$\ln|x^1 x^2 x^3 L^{0.724}| +$$

$$37.157116036323586^$$

$$\ln|x^1 x^2 x^3 L^{1.003}| +$$

$$0.03448180368170829^$$

$$J - 8.3 + \frac{x^1}{x^3} L^{1.691}$$

$$\ln|x^1 x^2 x^3 L^{1.003}| +$$

$$37.594448069928056^$$

$$\int \ln|1. + 0.000928 J - 8.3 + \frac{x^1}{x^3} L^{1.691}| dx \ln|x^1 x^2 x^3 L^{1.003}| L^{0.85} +$$

$$224864.40317144955^$$

$$\int \ln|2.2604108721379874| dx$$

$$\ln|x^1 x^2 x^3 L^{0.1666666666666666}| +$$

$$0.5373968269457794 x^5 \int \frac{1}{\ln|90. - \ln|1.37565|}| dx \ln|1.5466546977017742| * 10$$

$$c7^{3.78613} \bar{a}^k - 28.836809873393417$$

$$-5.7 + x4 + 7.463243262818116 x2 x4$$

$$\frac{6.387672141474464}{x1} - \frac{24.358395841320416 x2}{x1}$$

$$\frac{0.07135249685269171 x1}{x4}$$

$$\frac{7.875638056004192 x2 x4}{x1 x2 x4}$$

$$0. \bar{a} \cos B \frac{24.150700234490834}{x1}$$

$$x1 \frac{x4}{x2} H - 334.27762039660064 + 1. x2 x4$$

$$56056.632613855996 c6 x5^2 + 135.730345312 - 0.00205 +$$

$$H0.000010018884088099185 - 0.0002504721022024796 c4L$$

$$\bar{a} - 28.836809873393417 \cdot \frac{1}{x1} +$$

$$\frac{0.006}{H100. + x1L} 191.70788141720897 +$$

$$x1 \frac{0.7472141154913118 x2 - 0.0034468327443611183 x2^2}{x4} +$$

$$1.5082155619600681 x4 x5^2 +$$

$$236656.06714975525 \bar{a} \frac{1}{x5} H - 74.19790666961431 +$$

$$9.807 x4 + 0.03969110399999999 x5^2 LMM^3$$

$$13.779184373405185 + 1. x5 H - 74.19790666961431 +$$

$$9.807 x4 + 0.03969110399999999 x5^2 LMM^2 M +$$

$$10.179775898399999 0.93 + 1.1501585856866496$$

$$\frac{0.3004}{x1} + \frac{0.00014938078291814948 x1}{x1} \frac{x2}{x1} \frac{0.121563}{x1} \frac{1.06806}{x1}$$

$$\frac{x1^2}{x2 x4} \frac{0.36486}{x1} \frac{x4}{x1} \frac{0.46106}{x1} 191.70788141720897 +$$

$$x1 \frac{0.7472141154913118 x2 - 0.0034468327443611183 x2^2}{x4} +$$

$$191.70788141720897 + x \sqrt{0.7472141154913118 x^2 -$$

$$\frac{0.0034468327443611183 x^2}{x^4} + 1.5082155619600681 x^4 x^5 \sqrt{\quad}$$

$$3.6363748627922092 + 0.43429448190325176 \operatorname{Log}_{x1} x^5 l^2 \sqrt{\quad}^{\sqrt{\quad}} \wedge 0.6 \sqrt{\quad}$$

Appendix F

Mathematical Form of the Resistance

RT =

$$135.730345312 \cdot AT c6 x5^2 - \frac{0.662228354777248 \cdot ABT x5^2}{Cb} + \frac{1.9382293310553598 \cdot ABT x5^2}{Cb \sqrt{100. + x11^{0.16}}} +$$

$$\cdot \frac{0.014154825683162254 \cdot ABT Cb^3 \cdot \bar{a}^{-1.41434649220055} \cdot \frac{ABT^5}{hb-x4-ABT x2x4} x5^2}{k} -$$

$$0.35387064207905633 \cdot ABT c4 Cb^3 \cdot \bar{a}^{-1.41434649220055} \cdot \frac{ABT^5}{hb-x4-ABT x2x4} x5^2 +$$

$$\frac{569.2916975592 \cdot ABT^{1.5} \cdot \bar{a}^{-1.41434649220055} \cdot \frac{ABT^5}{hb-x4-ABT x2x4}}{k}$$

$$\frac{-2.45175 \cdot ABT - 9.807 \cdot hb + 9.807 \cdot x4 + 0.039691103999999999 \cdot x5^2}{k}$$

$$3 \cdot \frac{13.779184373405185}{k} +$$

$$1 \cdot \frac{1x5 \cdot | \cdot | - 2.45175 \cdot ABT - 9.807 \cdot hb + 9.807 \cdot x4 + 0.039691103999999999 \cdot x5^2}{k} +$$

$$x1^{3-2} \cdot \frac{x2^2}{k} - 0.000020619655732572913 \cdot Cb^4 \cdot \frac{ABT^5}{Cm \bar{a}^{-1.41434649220055} \cdot \frac{ABT^5}{hb-x4-ABT x2x4} x5^2} +$$

$$0.0005154913933143228 \cdot c4 Cb^4 \cdot \frac{ABT^5}{Cm \bar{a}^{-1.41434649220055} \cdot \frac{ABT^5}{hb-x4-ABT x2x4} x5^2} +$$

$$x4 \cdot \frac{0.005388349608800421 \cdot Cb^4 \cdot \frac{ABT^5}{Cm \bar{a}^{-1.41434649220055} \cdot \frac{ABT^5}{hb-x4-ABT x2x4} x5^2}}{k} -$$

$$0.13470874022001053 \cdot c4 Cb^4 \cdot \frac{ABT^5}{Cm \bar{a}^{-1.41434649220055} \cdot \frac{ABT^5}{hb-x4-ABT x2x4} x5^2} +$$

$$0.005263454088066636 \cdot Cb^5 \cdot \frac{ABT^5}{Cm \bar{a}^{-1.41434649220055} \cdot \frac{ABT^5}{hb-x4-ABT x2x4} x5^2} -$$

$$0.1315863522016659 \cdot c4 Cb^5 \cdot \frac{ABT^5}{Cm \bar{a}^{-1.41434649220055} \cdot \frac{ABT^5}{hb-x4-ABT x2x4} x5^2} -$$

$$0.0034042950508580147 \cdot Cb^4 \cdot \frac{ABT^5}{Cm^{3-2} \bar{a}^{-1.41434649220055} \cdot \frac{ABT^5}{hb-x4-ABT x2x4} x5^2} +$$

$$\begin{aligned}
& 0.08510737627145036 \cdot c4 Cb^4 \cdot Cm^{3 \cdot 2} \bar{a}^{-1.41434649220055} \cdot \frac{ABT^{1.5}}{hb-x4-ABT \cdot x2 \cdot x4} x5^{2.} + \\
& 0.004396322329829218 \cdot Cb^4 \cdot Cm Cw \bar{a}^{-1.41434649220055} \cdot \frac{ABT^{1.5}}{hb-x4-ABT \cdot x2 \cdot x4} x5^{2.} - \\
& 0.10990805824573044 \cdot c4 Cb^4 \cdot Cm Cw \bar{a}^{-1.41434649220055} \cdot \frac{ABT^{1.5}}{hb-x4-ABT \cdot x2 \cdot x4} x5^{2.} + \\
& x2 \cdot 0.002652935492935065 \cdot Cb^4 \cdot Cm \bar{a}^{-1.41434649220055} \cdot \frac{ABT^{1.5}}{hb-x4-ABT \cdot x2 \cdot x4} x5^{2.} - \\
& 0.06632338732337661 \cdot c4 Cb^4 \cdot Cm \bar{a}^{-1.41434649220055} \cdot \frac{ABT^{1.5}}{hb-x4-ABT \cdot x2 \cdot x4} x5^{2.} + \\
& 0.002631727044033318 \cdot Cb^5 \cdot Cm \bar{a}^{-1.41434649220055} \cdot \frac{ABT^{1.5}}{hb-x4-ABT \cdot x2 \cdot x4} x5^{2.} - \\
& 0.06579317610083295 \cdot c4 Cb^5 \cdot Cm \bar{a}^{-1.41434649220055} \cdot \frac{ABT^{1.5}}{hb-x4-ABT \cdot x2 \cdot x4} x5^{2.} - \\
& 0.0017021475254290074 \cdot Cb^4 \cdot Cm^{3 \cdot 2} \bar{a}^{-1.41434649220055} \cdot \frac{ABT^{1.5}}{hb-x4-ABT \cdot x2 \cdot x4} x5^{2.} + \\
& 0.04255368813572518 \cdot c4 Cb^4 \cdot Cm^{3 \cdot 2} \bar{a}^{-1.41434649220055} \cdot \frac{ABT^{1.5}}{hb-x4-ABT \cdot x2 \cdot x4} x5^{2.} + \\
& 0.002198161164914609 \cdot Cb^4 \cdot Cm Cw \bar{a}^{-1.41434649220055} \cdot \frac{ABT^{1.5}}{hb-x4-ABT \cdot x2 \cdot x4} x5^{2.} - \\
& 0.05495402912286522 \cdot c4 Cb^4 \cdot Cm Cw \bar{a}^{-1.41434649220055} \cdot \frac{ABT^{1.5}}{hb-x4-ABT \cdot x2 \cdot x4} x5^{2.} +
\end{aligned}$$

$$x1 \cdot 1.78933298360292 \cdot \text{hal}^{1.37565} \cdot AT c7^{3.78613} \cdot Cb$$

$$\bar{a}^{-1.41434649220055} \cdot \frac{ABT^{1.5}}{hb-x4-ABT \cdot x2 \cdot x4} +$$

$$5.081833302662383 \cdot c16 - \frac{4.79323 \cdot x2}{x1} + \frac{0.0140407 \cdot x1}{x4} -$$

$$\frac{1.75254 \cdot Cb \cdot x2 \cdot x4}{H Cb \cdot x1 \cdot x2 \cdot x4} + 0 \cdot \bar{a}^{-12.95314110595606}$$

$$\text{CosB} = \frac{-13.34248601399447}{x1} + \frac{53.59231882287779 \cdot Cb}{x2} + \frac{1.07961}{x4} +$$

$$x2^2 \cdot 0.0009646830697532433 \cdot Cm x5^{2.} - \frac{0.002823462643180224 \cdot Cm x5^{2.}}{H100. + x1L^{0.16}} -$$

$$\begin{aligned}
& \frac{0.032822753226970106 \cdot C_m x^5}{H3.6363748627922092 + 0.43429448190325176 \text{ Log} x} x^5 - \\
& \frac{0.017191993447758305 \cdot C_m}{1 - C_p + \frac{-1. + C_p}{-1. + C_p}} \left\{ \frac{x^2}{x^1} \right\}^{1.06806} \left\{ \frac{x^1}{C_b x^2 x^4} \right\}^{0.36486} \left\{ \frac{x^4}{x^1} \right\}^{0.46106} x^5 \cdot \\
& H1. - Cpl^{0.60247} H3.6363748627922092 + 0.43429448190325176 \text{ Log} x x^5 L - \\
& \frac{0.00018911192792534135 \cdot C_m C_{stern}}{1 - C_p + \frac{-1. + C_p}{-1. + C_p}} \left\{ \frac{x^2}{x^1} \right\}^{1.06806} \left\{ \frac{x^1}{C_b x^2 x^4} \right\}^{0.36486} \left\{ \frac{x^4}{x^1} \right\}^{0.46106} x^5 \cdot \\
& H1. - Cpl^{0.60247} \\
& H3.6363748627922092 + 0.43429448190325176 \text{ Log} x x^5 L + \\
& \frac{x^2}{H90. - hal} \left\{ \frac{x^1}{C_b} \right\}^{1.37565} 2.2366662295036503 \cdot 10 c^{7^{3.78613}} C_b \\
& \frac{\tilde{a}^3}{K} - 1.41434649220055 \cdot \frac{ABT^{1.5}}{hb - x^4 - \frac{ABT}{x^2 x^4}} + \\
& \frac{5.081833302662383}{K} \left\{ \frac{x^1}{x^1} \right\}^{0.9} - c16 - \frac{4.79323 \cdot x^2}{x^1} + \frac{0.0140407 \cdot x^1}{x^4} - \\
& \frac{1.75254 \cdot C_b x^2 x^4}{H C_b x^1 x^2 x^4 L^{0.6666666666666667}} + 0 \cdot \tilde{a} \frac{-12.052161110855605}{x^1} \text{ Cos} B \\
& \frac{-13.34248601399447 + 53.59231882287779 \cdot C_p}{K} \left\{ \frac{x^4}{x^1} \right\}^{1.07961} \left\{ \frac{x^4}{x^2} \right\} - \\
& 0.12411661903448232 \cdot C_m x^5 - 0.123124389491148 \cdot C_b \cdot C_m x^5 + \\
& 0.07963435089800353 \cdot C_m^{3 \cdot 2} x^5 - 0.10284016803599616 \cdot C_m C_w x^5 + \\
& \frac{0.36326815327165557 \cdot C_m x^5}{H100. + x1L^{0.16}} + \frac{0.36036406680336 \cdot C_b \cdot C_m x^5}{H100. + x1L^{0.16}} - \\
& \frac{0.2330761489697664 \cdot C_m^{3 \cdot 2} x^5}{H100. + x1L^{0.16}} + \frac{0.30099561376389117 \cdot C_m C_w x^5}{H100. + x1L^{0.16}} + \\
& \frac{4.222992281782996 \cdot C_m x^5}{H3.6363748627922092 + 0.43429448190325176 \text{ Log} x} x^5 + \\
& \frac{4.189232276589061 \cdot C_b \cdot C_m x^5}{H3.6363748627922092 + 0.43429448190325176 \text{ Log} x} x^5 -
\end{aligned}$$

$$\begin{aligned}
& 2.7095102317735344 \cdot \text{Cm}^{3 \cdot 2} x^{5 \cdot 2} \\
& \#3.6363748627922092 + 0.43429448190325176 \cdot \text{Log} @ x1 x5 \text{D}^2 + \\
& 3.4990740100052347 \cdot \text{Cm} \cdot \text{Cw} x^{5 \cdot 2} \\
& \#3.6363748627922092 + 0.43429448190325176 \cdot \text{Log} @ x1 x5 \text{D}^2 + \\
& 2.211930703567279 \cdot \text{Cm} \cdot \left\{ 1. - \text{Cp} + \frac{-1. + 4. \cdot \text{Cp}}{-1. + 4. \cdot \text{Cp}} \right\}^{0.121563} \\
& \int \frac{x^2}{x1} \int \frac{x^{1.2}}{\text{Cb} x2 x4} \int \frac{x^{0.36486}}{\text{Cb} x2 x4} \int \frac{x^{0.46106}}{x1} x^{5 \cdot 2} \mu \\
& \# \# 1. - \text{Cpl}^{0.60247} \# 3.6363748627922092 + 0.43429448190325176 \cdot \text{Log} @ x1 x5 \text{D}^2 \cdot \text{L} + \\
& 2.194247793663989 \cdot \text{Cb} \cdot \text{Cm} \cdot \left\{ 1. - \text{Cp} + \frac{-1. + 4. \cdot \text{Cp}}{-1. + 4. \cdot \text{Cp}} \right\}^{0.121563} \\
& \int \frac{x^2}{x1} \int \frac{x^{1.2}}{\text{Cb} x2 x4} \int \frac{x^{0.36486}}{\text{Cb} x2 x4} \int \frac{x^{0.46106}}{x1} x^{5 \cdot 2} \mu \\
& \# \# 1. - \text{Cpl}^{0.60247} \# 3.6363748627922092 + 0.43429448190325176 \cdot \text{Log} @ x1 x5 \text{D}^2 \cdot \text{L} - \\
& 1.4191948441731832 \cdot \text{Cm}^{3 \cdot 2} \cdot \left\{ 1. - \text{Cp} + \frac{-1. + 4. \cdot \text{Cp}}{-1. + 4. \cdot \text{Cp}} \right\}^{0.121563} \\
& \int \frac{x^2}{x1} \int \frac{x^{1.2}}{\text{Cb} x2 x4} \int \frac{x^{0.36486}}{\text{Cb} x2 x4} \int \frac{x^{0.46106}}{x1} x^{5 \cdot 2} \mu \\
& \# \# 1. - \text{Cpl}^{0.60247} \# 3.6363748627922092 + 0.43429448190325176 \cdot \text{Log} @ x1 x5 \text{D}^2 \cdot \text{L} + \\
& 0.024331237739240067 \cdot \text{Cm} \cdot \text{Cstern} \cdot \left\{ 1. - \text{Cp} + \frac{-1. + 4. \cdot \text{Cp}}{-1. + 4. \cdot \text{Cp}} \right\}^{0.121563} \\
& \int \frac{x^2}{x1} \int \frac{x^{1.2}}{\text{Cb} x2 x4} \int \frac{x^{0.36486}}{\text{Cb} x2 x4} \int \frac{x^{0.46106}}{x1} x^{5 \cdot 2} \mu \\
& \# \# 1. - \text{Cpl}^{0.60247} \# 3.6363748627922092 + 0.43429448190325176 \cdot \text{Log} @ x1 x5 \text{D}^2 \cdot \text{L} + \\
& 0.024136725730303878 \cdot \text{Cb} \cdot \text{Cm} \cdot \text{Cstern} \cdot \left\{ 1. - \text{Cp} + \frac{-1. + 4. \cdot \text{Cp}}{-1. + 4. \cdot \text{Cp}} \right\}^{0.121563} \\
& \int \frac{x^2}{x1} \int \frac{x^{1.2}}{\text{Cb} x2 x4} \int \frac{x^{0.36486}}{\text{Cb} x2 x4} \int \frac{x^{0.46106}}{x1} x^{5 \cdot 2} \mu \\
& \# \# 1. - \text{Cpl}^{0.60247} \# 3.6363748627922092 + 0.43429448190325176 \cdot \text{Log} @ x1 x5 \text{D}^2 \cdot \text{L} - \\
& 0.015611143285905016 \cdot \text{Cm}^{3 \cdot 2} \cdot \text{Cstern} \cdot \left\{ 1. - \text{Cp} + \frac{-1. + 4. \cdot \text{Cp}}{-1. + 4. \cdot \text{Cp}} \right\}^{0.121563} \\
& \int \frac{x^2}{x1} \int \frac{x^{1.2}}{\text{Cb} x2 x4} \int \frac{x^{0.36486}}{\text{Cb} x2 x4} \int \frac{x^{0.46106}}{x1} x^{5 \cdot 2} \mu \\
& \# \# 1. - \text{Cpl}^{0.60247} \# 3.6363748627922092 + 0.43429448190325176 \cdot \text{Log} @ x1 x5 \text{D}^2 \cdot \text{L} +
\end{aligned}$$

$$\begin{aligned}
& 1.8327547673179891 \cdot \text{Cm} \text{Cw} \left\{ \begin{array}{l} 1. - \text{Cp} + \\ -1. +4. \text{Cp} \end{array} \right\}^{0.121563} \\
& \left\{ \begin{array}{l} \frac{x^2}{x1} \quad 1.06806 \\ \frac{x1^2}{k \text{Cb} x2 x4} \quad 0.36486 \\ \frac{x^4}{x1} \quad 0.46106 \\ x5^2 \quad \mu \end{array} \right\} \\
& \text{H}1. - \text{Cpl}^{0.60247} \text{H}3.6363748627922092 + 0.43429448190325176 \text{Log}x1 x50L^2 L + \\
& 0.02016030244049788 \cdot \text{Cm} \text{Cstern} \text{Cw} \left\{ \begin{array}{l} 1. - \text{Cp} + \\ -1. +4. \text{Cp} \end{array} \right\}^{0.121563} \\
& \left\{ \begin{array}{l} \frac{x^2}{x1} \quad 1.06806 \\ \frac{x1^2}{k \text{Cb} x2 x4} \quad 0.36486 \\ \frac{x^4}{x1} \quad 0.46106 \\ x5^2 \quad \mu \end{array} \right\} \\
& \text{H}1. - \text{Cpl}^{0.60247} \text{H}3.6363748627922092 + 0.43429448190325176 \text{Log}x1 x50L^2 L + \\
& x4 \left\{ \begin{array}{l} -0.2520919703479776 \cdot \text{Cm} x5^2 - 0.246248778982296 \text{Cb} \cdot \text{Cm} x5^2 + \\ 0.15926870179600705 \text{Cm}^{3 \cdot 2} x5^2 - 0.20568033607199232 \cdot \text{Cm} \text{Cw} x5^2 + \\ \frac{0.737830157116032 \cdot \text{Cm} x5^2}{\text{H}100. + x1L^{0.16}} + \frac{0.72072813360672 \cdot \text{Cb} \cdot \text{Cm} x5^2}{\text{H}100. + x1L^{0.16}} - \\ \frac{0.4661522979395328 \cdot \text{Cm}^{3 \cdot 2} x5^2}{\text{H}100. + x1L^{0.16}} + \frac{0.6019912275277823 \cdot \text{Cm} \text{Cw} x5^2}{\text{H}100. + x1L^{0.16}} + \\ \frac{8.577275576473872 \cdot \text{Cm} x5^2}{\text{H}3.6363748627922092 + 0.43429448190325176 \text{Log}x1 x50L^2} + \\ \frac{8.378464553178121 \text{Cb} \cdot \text{Cm} x5^2}{\text{H}3.6363748627922092 + 0.43429448190325176 \text{Log}x1 x50L^2} - \\ \frac{5.419020463547069 \cdot \text{Cm}^{3 \cdot 2} x5^2}{\text{H}3.6363748627922092 + 0.43429448190325176 \text{Log}x1 x50L^2} + \\ \frac{6.998148020010469 \cdot \text{Cm} \text{Cw} x5^2}{\text{H}3.6363748627922092 + 0.43429448190325176 \text{Log}x1 x50L^2} + \\ 4.492629380925591 \cdot \text{Cm} \left\{ \begin{array}{l} 1. - \text{Cp} + \\ -1. +4. \text{Cp} \end{array} \right\}^{0.121563} \\
& \left\{ \begin{array}{l} \frac{x^2}{x1} \quad 1.06806 \\ \frac{x1^2}{k \text{Cb} x2 x4} \quad 0.36486 \\ \frac{x^4}{x1} \quad 0.46106 \\ x5^2 \quad \mu \end{array} \right\} \\
& \text{H}1. - \text{Cpl}^{0.60247} \text{H}3.6363748627922092 + 0.43429448190325176 \text{Log}x1 x50L^2 L + \\
& 4.388495587327978 \text{Cb} \cdot \text{Cm} \left\{ \begin{array}{l} 1. - \text{Cp} + \\ -1. +4. \text{Cp} \end{array} \right\}^{0.121563} \\
& \left\{ \begin{array}{l} \frac{x^2}{x1} \quad 1.06806 \\ \frac{x1^2}{k \text{Cb} x2 x4} \quad 0.36486 \\ \frac{x^4}{x1} \quad 0.46106 \\ x5^2 \quad \mu \end{array} \right\}
\end{aligned}$$

$$\text{III}1.\dot{\sim} - \text{Cpl}^{0.60247} \text{H}3.6363748627922092\dot{\sim} + 0.43429448190325176\dot{\sim} \text{Log}@x1 x50\text{L}^2.\dot{\sim} \text{L} -$$

$$\left\{ \begin{array}{l} 2.8383896883463664\dot{\sim} \text{Cm}^{3\cdot 2} \\ 1.\dot{\sim} - \text{Cp} + \end{array} \right\}^{0.121563}$$

$$\left\{ \begin{array}{l} \text{J} \frac{x^2}{x1} \\ \text{J} \frac{x^2}{\text{Cb} x2 x4} \\ \text{J} \frac{x^4}{x1} \\ x5^2.\dot{\sim} \end{array} \right\}^{0.121563}$$

$$\text{III}1.\dot{\sim} - \text{Cpl}^{0.60247} \text{H}3.6363748627922092\dot{\sim} + 0.43429448190325176\dot{\sim} \text{Log}@x1 x50\text{L}^2.\dot{\sim} \text{L} +$$

$$\left\{ \begin{array}{l} 0.0494189231901815\dot{\sim} \cdot \text{Cm} \\ \text{Cstern} \\ 1.\dot{\sim} - \text{Cp} + \end{array} \right\}^{0.121563}$$

$$\left\{ \begin{array}{l} \text{J} \frac{x^2}{x1} \\ \text{J} \frac{x^2}{\text{Cb} x2 x4} \\ \text{J} \frac{x^4}{x1} \\ x5^2.\dot{\sim} \end{array} \right\}^{0.121563}$$

$$\text{III}1.\dot{\sim} - \text{Cpl}^{0.60247} \text{H}3.6363748627922092\dot{\sim} + 0.43429448190325176\dot{\sim} \text{Log}@x1 x50\text{L}^2.\dot{\sim} \text{L} +$$

$$\left\{ \begin{array}{l} 0.048273451460607755\dot{\sim} \text{Cb} \cdot \text{Cm} \\ \text{Cstern} \\ 1.\dot{\sim} - \text{Cp} + \end{array} \right\}^{0.121563}$$

$$\left\{ \begin{array}{l} \text{J} \frac{x^2}{x1} \\ \text{J} \frac{x^2}{\text{Cb} x2 x4} \\ \text{J} \frac{x^4}{x1} \\ x5^2.\dot{\sim} \end{array} \right\}^{0.121563}$$

$$\text{III}1.\dot{\sim} - \text{Cpl}^{0.60247} \text{H}3.6363748627922092\dot{\sim} + 0.43429448190325176\dot{\sim} \text{Log}@x1 x50\text{L}^2.\dot{\sim} \text{L} -$$

$$\left\{ \begin{array}{l} 0.031222286571810032\dot{\sim} \text{Cm}^{3\cdot 2} \\ \text{Cstern} \\ 1.\dot{\sim} - \text{Cp} + \end{array} \right\}^{0.121563}$$

$$\left\{ \begin{array}{l} \text{J} \frac{x^2}{x1} \\ \text{J} \frac{x^2}{\text{Cb} x2 x4} \\ \text{J} \frac{x^4}{x1} \\ x5^2.\dot{\sim} \end{array} \right\}^{0.121563}$$

$$\text{III}1.\dot{\sim} - \text{Cpl}^{0.60247} \text{H}3.6363748627922092\dot{\sim} + 0.43429448190325176\dot{\sim} \text{Log}@x1 x50\text{L}^2.\dot{\sim} \text{L} +$$

$$\left\{ \begin{array}{l} 3.6655095346359783\dot{\sim} \cdot \text{Cm} \\ \text{Cw} \\ 1.\dot{\sim} - \text{Cp} + \end{array} \right\}^{0.121563}$$

$$\left\{ \begin{array}{l} \text{J} \frac{x^2}{x1} \\ \text{J} \frac{x^2}{\text{Cb} x2 x4} \\ \text{J} \frac{x^4}{x1} \\ x5^2.\dot{\sim} \end{array} \right\}^{0.121563}$$

$$\text{III}1.\dot{\sim} - \text{Cpl}^{0.60247} \text{H}3.6363748627922092\dot{\sim} + 0.43429448190325176\dot{\sim} \text{Log}@x1 x50\text{L}^2.\dot{\sim} \text{L} +$$

$$\left\{ \begin{array}{l} 0.04032060488099576\dot{\sim} \cdot \text{Cm} \\ \text{Cstern} \\ \text{Cw} \\ 1.\dot{\sim} - \text{Cp} + \end{array} \right\}^{0.121563}$$

$$\left\{ \begin{array}{l} \text{J} \frac{x^2}{x1} \\ \text{J} \frac{x^2}{\text{Cb} x2 x4} \\ \text{J} \frac{x^4}{x1} \\ x5^2.\dot{\sim} \end{array} \right\}^{0.121563}$$

$$\text{III}1.\dot{\sim} - \text{Cpl}^{0.60247} \text{H}3.6363748627922092\dot{\sim} + 0.43429448190325176\dot{\sim} \text{Log}@x1 x50\text{L}^2.\dot{\sim} \text{L} +$$

$$\left\{ \begin{array}{l} \text{Y} \\ \text{Z} \\ \text{Z} \end{array} \right\}$$

$$\left\{ \begin{array}{l} 22.531915973518558\dot{\sim} \text{ABT} \\ x5^2.\dot{\sim} \\ \text{Cb} \text{H}3.6363748627922092\dot{\sim} + 0.43429448190325176\dot{\sim} \text{Log}@x1 x50\text{L}^2.\dot{\sim} \end{array} \right\} +$$

$$11.80182994106281^{\wedge}$$

ABT

$$1. - Cp + \dots 0.121563^{\wedge}$$

$$J \frac{x^2}{x1} 1.06806^{\wedge}$$

$$J \frac{x1^2}{Cb x2 x4} 0.36486^{\wedge}$$

$$J \frac{x4}{x1} 0.46106^{\wedge}$$

$$x5^2 \dots$$

$$\#Cb \#1. - Cpl^{0.60247} \#3.6363748627922092^{\wedge} + 0.43429448190325176^{\wedge} \text{Log}@x1 x5 \#L^{2.} L +$$

$$0.1298201293516909^{\wedge} \text{ABT Cstern}$$

$$1. - Cp + \dots 0.121563^{\wedge}$$

$$J \frac{x^2}{x1} 1.06806^{\wedge}$$

$$J \frac{x1^2}{Cb x2 x4} 0.36486^{\wedge}$$

$$J \frac{x4}{x1} 0.46106^{\wedge} \quad x5^2 \dots$$

$$\#Cb \#1. - Cpl^{0.60247} \#3.6363748627922092^{\wedge} + 0.43429448190325176^{\wedge} \text{Log}@x1 x5 \#L^{2.} L$$

Appendix G

Mathematical Form of the Shaft Horsepower

SHP =

$$0.00044820375335120644 \cdot \frac{\text{ABT}^5}{\text{Cm}^4} x_5$$

$$-0.014154825683162254 \cdot \frac{\text{ABT}^5}{\text{Cm}^4} \text{Cb}^3 \cdot \bar{a}^{-1.41434649220055} \cdot \frac{\text{ABT}^5}{\text{hb}^{-x_4} \cdot \text{ABT}^2 x_4} x_5^2 -$$

$$+ 0.35387064207905633 \cdot \frac{\text{ABT}^5}{\text{Cm}^4} \text{c4 Cb}^3 \cdot \bar{a}^{-1.41434649220055} \cdot \frac{\text{ABT}^5}{\text{hb}^{-x_4} \cdot \text{ABT}^2 x_4} x_5^2 +$$

$$x_1^{3 \cdot 2} \cdot \frac{\text{ABT}^5}{\text{Cm}^4} \cdot \frac{\text{ABT}^5}{\text{hb}^{-x_4} \cdot \text{ABT}^2 x_4} x_5^2 - 0.000020619655732572913 \cdot \text{Cb}^4 \cdot \frac{\text{ABT}^5}{\text{Cm}^4}$$

$$\bar{a}^{-1.41434649220055} \cdot \frac{\text{ABT}^5}{\text{hb}^{-x_4} \cdot \text{ABT}^2 x_4} x_5^2 + 0.0005154913933143228 \cdot \text{c4 Cb}^4 \cdot$$

$$\frac{\text{ABT}^5}{\text{Cm}^4} \bar{a}^{-1.41434649220055} \cdot \frac{\text{ABT}^5}{\text{hb}^{-x_4} \cdot \text{ABT}^2 x_4} x_5^2 + 0.00044820375335120644 \cdot x_4$$

$$x_5^3 \cdot \frac{\text{ABT}^5}{\text{Cm}^4} \text{Cb}^4 \cdot \frac{\text{ABT}^5}{\text{Cm}^4} \bar{a}^{-1.41434649220055} \cdot \frac{\text{ABT}^5}{\text{hb}^{-x_4} \cdot \text{ABT}^2 x_4} x_5^2 -$$

$$0.13470874022001053 \cdot \text{c4 Cb}^4 \cdot \frac{\text{ABT}^5}{\text{Cm}^4} \bar{a}^{-1.41434649220055} \cdot \frac{\text{ABT}^5}{\text{hb}^{-x_4} \cdot \text{ABT}^2 x_4} x_5^2 +$$

$$0.005263454088066636 \cdot \text{Cb}^5 \cdot \frac{\text{ABT}^5}{\text{Cm}^4} \bar{a}^{-1.41434649220055} \cdot \frac{\text{ABT}^5}{\text{hb}^{-x_4} \cdot \text{ABT}^2 x_4} x_5^2 -$$

$$0.1315863522016659 \cdot \text{c4 Cb}^5 \cdot \frac{\text{ABT}^5}{\text{Cm}^4} \bar{a}^{-1.41434649220055} \cdot \frac{\text{ABT}^5}{\text{hb}^{-x_4} \cdot \text{ABT}^2 x_4} x_5^2 -$$

$$0.0034042950508580147 \cdot \text{Cb}^4 \cdot \text{Cm}^{3 \cdot 2} \bar{a}^{-1.41434649220055} \cdot \frac{\text{ABT}^5}{\text{hb}^{-x_4} \cdot \text{ABT}^2 x_4} x_5^2 +$$

$$0.08510737627145036 \cdot \text{c4 Cb}^4 \cdot \text{Cm}^{3 \cdot 2} \bar{a}^{-1.41434649220055} \cdot \frac{\text{ABT}^5}{\text{hb}^{-x_4} \cdot \text{ABT}^2 x_4} x_5^2 +$$

$$0.004396322329829218 \cdot \text{Cb}^4 \cdot \frac{\text{ABT}^5}{\text{Cm}^4} \text{Cw} \bar{a}^{-1.41434649220055} \cdot \frac{\text{ABT}^5}{\text{hb}^{-x_4} \cdot \text{ABT}^2 x_4} x_5^2 -$$

$$0.10990805824573044 \cdot \text{c4 Cb}^4 \cdot \frac{\text{ABT}^5}{\text{Cm}^4} \text{Cw} \bar{a}^{-1.41434649220055} \cdot \frac{\text{ABT}^5}{\text{hb}^{-x_4} \cdot \text{ABT}^2 x_4} x_5^2 +$$

$$0.00044820375335120644 \cdot x_2 x_5 \cdot \frac{\text{ABT}^5}{\text{Cm}^4} \text{Cb}^4 \cdot \frac{\text{ABT}^5}{\text{Cm}^4}$$

$$\begin{aligned}
& \bar{a}^{-1.41434649220055} \left[\frac{ABT^{1.5}}{hb-x4-ABT^2x4} x5^2 \right] - \\
& 0.06632338732337661 \cdot c4 Cb^4 \cdot \left[\frac{ABT^{1.5}}{hb-x4-ABT^2x4} x5^2 \right] + \\
& 0.002631727044033318 \cdot Cb^5 \cdot \left[\frac{ABT^{1.5}}{hb-x4-ABT^2x4} x5^2 \right] - \\
& 0.06579317610083295 \cdot c4 Cb^5 \cdot \left[\frac{ABT^{1.5}}{hb-x4-ABT^2x4} x5^2 \right] - \\
& 0.0017021475254290074 \cdot Cb^4 \cdot C_m^{3 \cdot 2} \bar{a}^{-1.41434649220055} \left[\frac{ABT^{1.5}}{hb-x4-ABT^2x4} x5^2 \right] + \\
& 0.04255368813572518 \cdot c4 Cb^4 \cdot C_m^{3 \cdot 2} \bar{a}^{-1.41434649220055} \left[\frac{ABT^{1.5}}{hb-x4-ABT^2x4} x5^2 \right] + \\
& 0.002198161164914609 \cdot Cb^4 \cdot C_m C_w \bar{a}^{-1.41434649220055} \left[\frac{ABT^{1.5}}{hb-x4-ABT^2x4} x5^2 \right] - \\
& 0.05495402912286522 \cdot c4 Cb^4 \cdot C_m C_w \bar{a}^{-1.41434649220055} \left[\frac{ABT^{1.5}}{hb-x4-ABT^2x4} x5^2 \right] +
\end{aligned}$$

$$x1 \left[\frac{1}{k} \int_{-1}^1 C_m H_{90} \cdot \text{hal}^{1.37565} \cdot 8.019857592459415 \cdot *^6 AT c7^{3.78613} Cb \right]$$

$$\begin{aligned}
& \bar{a}^{-1.41434649220055} \cdot \left[\frac{ABT^{1.5}}{hb-x4-ABT^2x4} \right] + \\
& \left[\frac{1}{x1} \int_{-1}^1 5.081833302662383 \right] \cdot c16 - \frac{4.79323 \cdot x2}{x1} + \frac{0.0140407 \cdot x1}{x4} - \\
& \frac{1.75254 \cdot Cb \cdot x2 \cdot x4}{HCb \cdot x1 \cdot x2 \cdot x4} \cdot \left[\frac{w}{z} + 0 \cdot \bar{a} \right] + \\
& \text{CosB} \cdot \frac{-13.34248601399447 + 53.59231882287779 \cdot C_p}{x1} \cdot \frac{x4}{x2} \cdot 1.07961 \cdot x5 +
\end{aligned}$$

$$x2 \left[\frac{1}{k} \int_{-1}^1 H_{90} \cdot \text{hal}^{1.37565} \cdot 1.002482199057427 \cdot *^7 c7^{3.78613} Cb \bar{a}^{-1.41434649220055} \right]$$

$$\begin{aligned}
& \bar{a}^{-1.41434649220055} \cdot \left[\frac{ABT^{1.5}}{hb-x4-ABT^2x4} \right] + \left[\frac{1}{x1} \int_{-1}^1 5.081833302662383 \right] \cdot c16 - \\
& \frac{4.79323 \cdot x2}{x1} + \frac{0.0140407 \cdot x1}{x4} - \frac{1.75254 \cdot Cb \cdot x2 \cdot x4}{HCb \cdot x1 \cdot x2 \cdot x4} \cdot \left[\frac{w}{z} \right] + \\
& 0 \cdot \bar{a} \cdot \text{CosB} \cdot \frac{-13.34248601399447 + 53.59231882287779 \cdot C_p}{x1}
\end{aligned}$$

$$x^4 \int \frac{x^{1.07961}}{x^2} dx + 0.00044820375335120644 x^5$$

$$\begin{aligned}
 & -0.12411661903448232 \cdot C_m^{(1)} x^{5.2} - 0.123124389491148 \cdot C_b \cdot C_m^{(1)} x^{5.2} + \\
 & 0.07963435089800353 \cdot C_m^{(3-2)} x^{5.2} - 0.10284016803599616 \cdot C_m^{(1)} C_w x^{5.2} + \\
 & \frac{0.36326815327165557 \cdot C_m^{(1)} x^{5.2}}{H_{100} + x L^{0.16}} + \frac{0.36036406680336 \cdot C_b \cdot C_m^{(1)} x^{5.2}}{H_{100} + x L^{0.16}} - \\
 & \frac{0.2330761489697664 \cdot C_m^{(3-2)} x^{5.2}}{H_{100} + x L^{0.16}} + \frac{0.30099561376389117 \cdot C_m^{(1)} C_w x^{5.2}}{H_{100} + x L^{0.16}} + \\
 & \frac{4.222992281782996 \cdot C_m^{(1)} x^{5.2}}{H_{3.6363748627922092} + 0.43429448190325176 \cdot \text{Log} x L^{0.16}} + \\
 & \frac{4.189232276589061 \cdot C_b \cdot C_m^{(1)} x^{5.2}}{H_{3.6363748627922092} + 0.43429448190325176 \cdot \text{Log} x L^{0.16}} - \\
 & \frac{2.7095102317735344 \cdot C_m^{(3-2)} x^{5.2}}{H_{3.6363748627922092} + 0.43429448190325176 \cdot \text{Log} x L^{0.16}} + \\
 & \frac{3.4990740100052347 \cdot C_m^{(1)} C_w x^{5.2}}{H_{3.6363748627922092} + 0.43429448190325176 \cdot \text{Log} x L^{0.16}} + \\
 & \int \frac{2.211930703567279 \cdot C_m^{(1)}}{1 - C_p + \frac{0.121563}{-1 + C_p}} dx \\
 & \int \frac{x^{1.06806}}{x^1} dx \int \frac{x^{1.2}}{C_b x^2 x^4} dx \int \frac{x^{0.36486}}{x^1} dx \int \frac{x^{0.46106}}{x^1} dx x^{5.2} \cdot H_{1.} - C_{pl}^{0.60247} \\
 & H_{3.6363748627922092} + 0.43429448190325176 \cdot \text{Log} x L^{0.16} + \\
 & \int \frac{2.194247793663989 \cdot C_b \cdot C_m^{(1)}}{1 - C_p + \frac{0.121563}{-1 + C_p}} dx \\
 & \int \frac{x^{1.06806}}{x^1} dx \int \frac{x^{1.2}}{C_b x^2 x^4} dx \int \frac{x^{0.36486}}{x^1} dx \int \frac{x^{0.46106}}{x^1} dx x^{5.2} \cdot H_{1.} - C_{pl}^{0.60247} \\
 & H_{3.6363748627922092} + 0.43429448190325176 \cdot \text{Log} x L^{0.16} - \\
 & \int \frac{1.4191948441731832 \cdot C_m^{(3-2)}}{1 - C_p + \frac{0.121563}{-1 + C_p}} dx \\
 & \int \frac{x^{1.06806}}{x^1} dx \int \frac{x^{1.2}}{C_b x^2 x^4} dx \int \frac{x^{0.36486}}{x^1} dx \int \frac{x^{0.46106}}{x^1} dx x^{5.2} \cdot H_{1.} - C_{pl}^{0.60247} \\
 & H_{3.6363748627922092} + 0.43429448190325176 \cdot \text{Log} x L^{0.16} + \\
 & \int \frac{0.024331237739240067 \cdot C_m^{(1)} C_{stern}}{1 - C_p + \frac{0.121563}{-1 + C_p}} dx
 \end{aligned}$$

$$\begin{aligned}
& \text{HH1.}^{\cdot} - \text{Cpl}^{0.60247} \text{H3.6363748627922092}^{\cdot} + 0.43429448190325176^{\cdot} \text{Log@x1 x5DL}^{2.} \text{L} - \\
& \left\{ \begin{array}{l} 0.00018911192792534135^{\cdot} \cdot \text{Cm}^{\cdot} \text{Cstern}^{\cdot} \\ 1. - \text{Cp} + \text{Cp} \end{array} \right\}^{0.121563} \\
& \left\{ \begin{array}{l} \text{J} \frac{x^2}{x1} \\ \text{J} \frac{x1^2}{\text{Cb } x2 \text{ } x4} \\ \text{J} \frac{x4}{x1} \end{array} \right\}^{1.06806} \left\{ \begin{array}{l} \text{J} \frac{x1^2}{\text{Cb } x2 \text{ } x4} \\ \text{J} \frac{x4}{x1} \end{array} \right\}^{0.36486} \left\{ \begin{array}{l} \text{J} \frac{x4}{x1} \\ x5^2. \end{array} \right\}^{0.46106} \text{HH1.}^{\cdot} - \text{Cpl}^{0.60247} \\
& \text{H3.6363748627922092}^{\cdot} + 0.43429448190325176^{\cdot} \text{Log@x1 x5DL}^{2.} \text{L} + \\
& 0.00044820375335120644^{\cdot} x4 \text{ } x5^3 - 0.2520919703479776^{\cdot} \cdot \text{Cm}^{\cdot} x5^{2.} - \\
& 0.246248778982296^{\cdot} \text{Cb} \cdot \text{Cm}^{\cdot} x5^{2.} + 0.15926870179600705^{\cdot} \text{Cm}^{3+2} x5^{2.} - \\
& 0.20568033607199232^{\cdot} \cdot \text{Cm}^{\cdot} \text{Cw } x5^{2.} + \\
& \frac{0.737830157116032^{\cdot} \cdot \text{Cm}^{\cdot} x5^{2.}}{\text{H100.}^{\cdot} + x1\text{L}^{0.16}} + \frac{0.72072813360672^{\cdot} \text{Cb} \cdot \text{Cm}^{\cdot} x5^{2.}}{\text{H100.}^{\cdot} + x1\text{L}^{0.16}} - \\
& \frac{0.4661522979395328^{\cdot} \text{Cm}^{3+2} x5^{2.}}{\text{H100.}^{\cdot} + x1\text{L}^{0.16}} + \\
& \frac{0.6019912275277823^{\cdot} \cdot \text{Cm}^{\cdot} \text{Cw } x5^{2.}}{\text{H100.}^{\cdot} + x1\text{L}^{0.16}} + \\
& \frac{8.577275576473872^{\cdot} \cdot \text{Cm}^{\cdot} x5^{2.}}{\text{H3.6363748627922092}^{\cdot} + 0.43429448190325176^{\cdot} \text{Log@x1 x5DL}^{2.}} + \\
& \frac{8.378464553178121^{\cdot} \text{Cb} \cdot \text{Cm}^{\cdot} x5^{2.}}{\text{H3.6363748627922092}^{\cdot} + 0.43429448190325176^{\cdot} \text{Log@x1 x5DL}^{2.}} - \\
& \frac{5.419020463547069^{\cdot} \text{Cm}^{3+2} x5^{2.}}{\text{H3.6363748627922092}^{\cdot} + 0.43429448190325176^{\cdot} \text{Log@x1 x5DL}^{2.}} + \\
& \frac{6.998148020010469^{\cdot} \cdot \text{Cm}^{\cdot} \text{Cw } x5^{2.}}{\text{H3.6363748627922092}^{\cdot} + 0.43429448190325176^{\cdot} \text{Log@x1 x5DL}^{2.}} + \\
& \left\{ \begin{array}{l} 4.492629380925591^{\cdot} \cdot \text{Cm}^{\cdot} \\ 1. - \text{Cp} + \text{Cp} \end{array} \right\}^{0.121563} \\
& \left\{ \begin{array}{l} \text{J} \frac{x^2}{x1} \\ \text{J} \frac{x1^2}{\text{Cb } x2 \text{ } x4} \\ \text{J} \frac{x4}{x1} \end{array} \right\}^{1.06806} \left\{ \begin{array}{l} \text{J} \frac{x1^2}{\text{Cb } x2 \text{ } x4} \\ \text{J} \frac{x4}{x1} \end{array} \right\}^{0.36486} \left\{ \begin{array}{l} \text{J} \frac{x4}{x1} \\ x5^2. \end{array} \right\}^{0.46106} \text{HH1.}^{\cdot} - \text{Cpl}^{0.60247} \text{H3.6363748627922092}^{\cdot} + 0.43429448190325176^{\cdot} \text{Log@x1 x5DL}^{2.} \text{L} + \\
& \left\{ \begin{array}{l} 4.388495587327978^{\cdot} \text{Cb} \cdot \text{Cm}^{\cdot} \\ 1. - \text{Cp} + \text{Cp} \end{array} \right\}^{0.121563} \\
& \left\{ \begin{array}{l} \text{J} \frac{x^2}{x1} \\ \text{J} \frac{x1^2}{\text{Cb } x2 \text{ } x4} \\ \text{J} \frac{x4}{x1} \end{array} \right\}^{1.06806} \left\{ \begin{array}{l} \text{J} \frac{x1^2}{\text{Cb } x2 \text{ } x4} \\ \text{J} \frac{x4}{x1} \end{array} \right\}^{0.36486} \left\{ \begin{array}{l} \text{J} \frac{x4}{x1} \\ x5^2. \end{array} \right\}^{0.46106} \text{HH1.}^{\cdot} - \text{Cpl}^{0.60247} \text{H3.6363748627922092}^{\cdot} + 0.43429448190325176^{\cdot} \text{Log@x1 x5DL}^{2.} \text{L} -
\end{aligned}$$

$$2.8383896883463664 \cdot \text{Cm}^{3 \cdot 2} \cdot \left(1 - \text{Cp} + \frac{\text{Cp}^2}{-1 + 4 \cdot \text{Cp}} \right)^{0.121563}$$

$$\left(\frac{x^2}{x^1} \right)^{1.06806} \cdot \left(\frac{x^{1 \cdot 2}}{\text{Cb} \cdot x^2 \cdot x^4} \right)^{0.36486} \cdot \left(\frac{x^4}{x^1} \right)^{0.46106} \cdot x^{5 \cdot 2}$$

$$\text{H}1 - \text{Cpl}^{0.60247} \cdot \text{H}3.6363748627922092 + 0.43429448190325176 \cdot \text{Log}x \cdot x^{50} \cdot L^2 +$$

$$0.0494189231901815 \cdot \text{Cm} \cdot \text{Cstern} \cdot \left(1 - \text{Cp} + \frac{\text{Cp}^2}{-1 + 4 \cdot \text{Cp}} \right)^{0.121563}$$

$$\left(\frac{x^2}{x^1} \right)^{1.06806} \cdot \left(\frac{x^{1 \cdot 2}}{\text{Cb} \cdot x^2 \cdot x^4} \right)^{0.36486} \cdot \left(\frac{x^4}{x^1} \right)^{0.46106} \cdot x^{5 \cdot 2}$$

$$\text{H}1 - \text{Cpl}^{0.60247} \cdot \text{H}3.6363748627922092 + 0.43429448190325176 \cdot \text{Log}x \cdot x^{50} \cdot L^2 +$$

$$0.048273451460607755 \cdot \text{Cb} \cdot \text{Cm} \cdot \text{Cstern} \cdot \left(1 - \text{Cp} + \frac{\text{Cp}^2}{-1 + 4 \cdot \text{Cp}} \right)^{0.121563}$$

$$\left(\frac{x^2}{x^1} \right)^{1.06806} \cdot \left(\frac{x^{1 \cdot 2}}{\text{Cb} \cdot x^2 \cdot x^4} \right)^{0.36486} \cdot \left(\frac{x^4}{x^1} \right)^{0.46106} \cdot x^{5 \cdot 2}$$

$$\text{H}1 - \text{Cpl}^{0.60247} \cdot \text{H}3.6363748627922092 + 0.43429448190325176 \cdot \text{Log}x \cdot x^{50} \cdot L^2 -$$

$$0.031222286571810032 \cdot \text{Cm}^{3 \cdot 2} \cdot \text{Cstern} \cdot \left(1 - \text{Cp} + \frac{\text{Cp}^2}{-1 + 4 \cdot \text{Cp}} \right)^{0.121563}$$

$$\left(\frac{x^2}{x^1} \right)^{1.06806} \cdot \left(\frac{x^{1 \cdot 2}}{\text{Cb} \cdot x^2 \cdot x^4} \right)^{0.36486} \cdot \left(\frac{x^4}{x^1} \right)^{0.46106} \cdot x^{5 \cdot 2}$$

$$\text{H}1 - \text{Cpl}^{0.60247} \cdot \text{H}3.6363748627922092 + 0.43429448190325176 \cdot \text{Log}x \cdot x^{50} \cdot L^2 +$$

$$3.6655095346359783 \cdot \text{Cm} \cdot \text{Cw} \cdot \left(1 - \text{Cp} + \frac{\text{Cp}^2}{-1 + 4 \cdot \text{Cp}} \right)^{0.121563}$$

$$\left(\frac{x^2}{x^1} \right)^{1.06806} \cdot \left(\frac{x^{1 \cdot 2}}{\text{Cb} \cdot x^2 \cdot x^4} \right)^{0.36486} \cdot \left(\frac{x^4}{x^1} \right)^{0.46106} \cdot x^{5 \cdot 2}$$

$$\text{H}1 - \text{Cpl}^{0.60247} \cdot \text{H}3.6363748627922092 + 0.43429448190325176 \cdot \text{Log}x \cdot x^{50} \cdot L^2 +$$

$$0.04032060488099576 \cdot \text{Cm} \cdot \text{Cstern} \cdot \text{Cw} \cdot \left(1 - \text{Cp} + \frac{\text{Cp}^2}{-1 + 4 \cdot \text{Cp}} \right)^{0.121563}$$

$$\left(\frac{x^2}{x^1} \right)^{1.06806} \cdot \left(\frac{x^{1 \cdot 2}}{\text{Cb} \cdot x^2 \cdot x^4} \right)^{0.36486} \cdot \left(\frac{x^4}{x^1} \right)^{0.46106} \cdot x^{5 \cdot 2}$$

$$\text{H}1 - \text{Cpl}^{0.60247} \cdot \text{H}3.6363748627922092 + 0.43429448190325176 \cdot \text{Log}x \cdot x^{50} \cdot L^2 +$$

$$0.00044820375335120644 \cdot x^5 \cdot 135.730345312 \cdot \text{AT} \cdot c_6 \cdot x^{5 \cdot 2} -$$

$$\frac{0.662228354777248 \cdot \text{ABT} x^{5^2}}{\text{Cb}} +$$

$$\frac{1.9382293310553598 \cdot \text{ABT} x^{5^2}}{\text{Cb} \sqrt{100} + x^{11^{0.16}}} +$$

$$\frac{569.2916975592 \cdot \text{ABT}^{1.5} \cdot \frac{0.566236320613344}{k=1.5 \cdot \sqrt{hb+x^2}}}{k}$$

$$1x5 \cdot | \cdot | - 2.45175 \cdot \frac{0.111111111111111}{\text{ABT}} - 9.807 \cdot hb + 9.807 \cdot x4 + 0.03969110399999999 \cdot x5^2 \cdot \text{MM}^\wedge$$

$$3. \cdot \frac{0.111111111111111}{\sqrt{}} | 3.779184373405185 \cdot +$$

$$1. \cdot 1x5 \cdot | \cdot | - 2.45175 \cdot \frac{0.111111111111111}{\text{ABT}} - 9.807 \cdot hb + 9.807 \cdot x4 + 0.03969110399999999 \cdot x5^2 \cdot \text{MM}^\wedge$$

$$2. \cdot \text{M} +$$

$$\frac{22.531915973518558 \cdot \text{ABT} x^{5^2}}{\text{Cb} \sqrt{3.6363748627922092} + 0.43429448190325176 \cdot \text{Log}@x1 x5 \text{DL}^\wedge}$$

$$\frac{11.80182994106281 \cdot \text{ABT}}{k} \cdot \frac{0.121563}{1. - \text{Cp} + \frac{0.121563}{-1. + 4. \cdot \text{Cp}}}$$

$$\frac{J \frac{x^2}{x1} \cdot 1.06806}{k} \cdot \frac{J \frac{x1^2}{\text{Cb} x2 x4} \cdot 0.36486}{k} \cdot \frac{J \frac{x4}{x1} \cdot 0.46106}{k} \cdot x5^2 \cdot \frac{0.121563}{k}$$

$$\sqrt{\text{Cb} \sqrt{1.} - \text{Cp} L^{0.60247} \sqrt{3.6363748627922092} + 0.43429448190325176 \cdot \text{Log}@x1 x5 \text{DL}^\wedge} \cdot L +$$

$$\frac{0.1298201293516909 \cdot \text{ABT} \cdot \text{Cstern}}{k} \cdot \frac{0.121563}{1. - \text{Cp} + \frac{0.121563}{-1. + 4. \cdot \text{Cp}}}$$

$$\frac{J \frac{x^2}{x1} \cdot 1.06806}{k} \cdot \frac{J \frac{x1^2}{\text{Cb} x2 x4} \cdot 0.36486}{k} \cdot \frac{J \frac{x4}{x1} \cdot 0.46106}{k} \cdot x5^2 \cdot \frac{0.121563}{k}$$

$$\sqrt{\text{Cb} \sqrt{1.} - \text{Cp} L^{0.60247} \sqrt{3.6363748627922092} + 0.43429448190325176 \cdot \text{Log}@x1 x5 \text{DL}^\wedge} \cdot L$$

Appendix H

Mathematical Form of the Lightship Weight

WL =

$$\begin{aligned}
 & 1.03 \cdot 10.6197720682895518 \cdot Hx1 \cdot x2 \cdot x3L^{0.724} + 0.05705477170296265 \cdot \\
 & H1. + 0.49532 \cdot CbL \cdot H1. + 0.000928 \cdot H - 8.3 \cdot x1 \cdot x3L^{1.691} \cdot L \cdot Hx1 \cdot x2 \cdot x3L^{1.003} + \\
 & 0.0011232166043994344 \cdot lx5 \cdot l1 \cdot H90. - haL^{1.37565} \cdot l2.2366662295036503 \cdot c^{10} \cdot c7^{3.78613} \cdot \\
 & Cb \cdot \bar{a}^{1-1.41434649220055} \cdot l - ABT^{1.5} \cdot lhb - x4 - ABT \cdot x2 \cdot x4^{MM} + \\
 & H5.081833302662383 \cdot H - c16 - H4.79323 \cdot x2L \cdot x1 + H0.0140407 \cdot x1L \cdot x4 - \\
 & H1.75254 \cdot Cb \cdot x2 \cdot x4L \cdot HCb \cdot x1 \cdot x2 \cdot x4L^{0.6666666666666667} \cdot ll' \\
 & lx5 \cdot l' \cdot x1^{MM^{0.9}} + 0. \bar{a}^{1-12.953161110595605} \cdot lx5 \cdot l' \cdot x1^{MM^{3.29}} \cdot \\
 & CosAH - 13.34248601399447 + 53.59231882287779 \cdot Cpl' \\
 & lx5 \cdot l' \cdot x1^{MM^2} \cdot EM \cdot x1 \cdot x2 \cdot H1. - H0.8 \cdot ATL \cdot Hcm \cdot x2 \cdot x4LL \\
 & x4 \cdot Hx4 \cdot x2L^{1.07961} \cdot M + 135.730345312 \cdot AT \cdot c6 \cdot x5^{2.} + \\
 & 135.730345312 \cdot l - 0.00205 - 0.0010954451150103322 \cdot H - 0.04 + 1. \cdot c4L \cdot Cb^{4.} \\
 & \bar{a}^{1-1.41434649220055} \cdot l - ABT^{1.5} \cdot lhb - x4 - ABT \cdot x2 \cdot x4^{MM} \cdot x1 + \\
 & 0.006 \cdot H100. + x1L^{0.16} \cdot MH2.38 \cdot ABTL \cdot Cb + Cm \cdot x1 \cdot H0.453 + \\
 & 0.4425 \cdot Cb - 0.2862 \cdot Cm + 0.3696 \cdot Cw - H0.003467 \cdot x2L \cdot x4L \cdot Hx2 + 2. \cdot x4LM \\
 & x5^{2.} + 1569.2916975592 \cdot ABT^{1.5} \cdot \bar{a}^{1-9.566326530612244} \cdot \\
 & ll' \cdot ABTM \cdot H - 1.5 \cdot hb + x4LM^{2.} \cdot M \cdot lx5 \cdot l' \cdot l - 2.45175 \cdot ABT - \\
 & 9.807 \cdot hb + 9.807 \cdot x4 + 0.03969110399999999 \cdot x5^{2.} \cdot M^{3.} \cdot M' \\
 & 13.779184373405185 + 1. \cdot lx5 \cdot l' \cdot l - 2.45175 \cdot ABT - 9.807 \cdot hb + 9.807 \cdot x4 + \\
 & 0.03969110399999999 \cdot x5^{2.} \cdot M^{2.} \cdot M + 110.179775898399999 \cdot \\
 & H0.93 + 1 \cdot H1. - Cpl^{0.60247} \cdot H0.487118 \cdot H1. + 0.011 \cdot CsternL \\
 & H1 \cdot H1. - Cp + H0.000384 \cdot Cp \cdot x1L \cdot H - 1. + 4. \cdot CplLL^{0.121563} \cdot \\
 & Hx2 \cdot x1L^{1.06806} \cdot Hx1^{2.} \cdot HCb \cdot x2 \cdot x4LL^{0.36486} \cdot Hx4 \cdot x1L^{0.46106} \cdot LL \\
 & H2.38 \cdot ABTL \cdot Cb + Cm \cdot x1 \cdot H0.453 + 0.4425 \cdot Cb - 0.2862 \cdot Cm + \\
 & 0.3696 \cdot Cw - H0.003467 \cdot x2L \cdot x4L \cdot Hx2 + 2. \cdot x4LM \cdot x5^{2.} \cdot M' \\
 & H3.6363748627922092 + 0.43429448190325176 \cdot \text{Log} \cdot x1 \cdot x5DL^{2.} \cdot M^{0.775} \cdot M
 \end{aligned}$$

Appendix I

Mathematical Form of the Center of Gravity of Lightship Weight

WL =

$$0.3 - 0.0004270229550515012 \cdot x_1 x_3 \cdot H x_1 x_2 x_3 L^{0.724} L''$$

$$\begin{aligned}
 & 0.6197720682895518 \cdot H x_1 x_2 x_3 L^{0.724} + 0.05705477170296265 \cdot H L'' + 0.49532 \cdot C b L \\
 & 1. + 0.000928 \cdot J - 8.3 + \frac{x_1^{1.691}}{x_3} \cdot H x_1 x_2 x_3 L^{1.003} + 0.0011232166043994344 \\
 & x_5 \cdot H 90. - \text{hal}^{1.57563} \cdot 2.2366662295036503 \cdot *^{\wedge} 10 c 7^{3.78613} \cdot C b \bar{a}^{\wedge} - 1.41434649220055 \\
 & \& \frac{A B T^{1.5}}{h b - x_4 - A B T x_2 x_4} + \frac{1}{x_1} \cdot 5.081833302662383 \\
 & - c 16 - \frac{4.79323 \cdot x_2}{x_1} + \frac{0.0140407 \cdot x_1}{x_4} - \\
 & \frac{1.75254 \cdot C b x_2 x_4}{H C b x_1 x_2 x_4 L^{0.6666666666666667}} + 0. \bar{a} \\
 & \text{CosB} = \frac{-13.34248601399447 + 53.59231882287779 \cdot C p}{x_1} \\
 & x_2 J 1. - \frac{0.8 \cdot A T}{C m x_2 x_4} \cdot \frac{x_4}{x_2} \cdot 1.07961 + 135.730345312 \cdot A T c 6 x_5^2 + \\
 & 135.730345312 - 0.00205 - 0.0010954451150103322 \cdot H - 0.04 + 1. \cdot c 4 L \\
 & C b^4 \cdot \bar{a}^{-1.41434649220055} \cdot \frac{A B T^{1.5}}{h b - x_4 - A B T x_2 x_4} \cdot \frac{1}{x_1} + \frac{0.006}{H 100. + x_1 L^{0.16}} \\
 & \frac{2.38 \cdot A B T}{C b} + \frac{1}{C m} x_1 J 0.453 + 0.4425 \cdot C b - 0.2862 \cdot C m + \\
 & 0.3696 \cdot C w - \frac{0.003467 \cdot x_2}{x_4} \cdot H x_2 + 2. \cdot x_4 L x_5^2 +
 \end{aligned}$$

$$\begin{aligned}
& x2 J1. \cdot - \frac{0.8 \cdot AT}{Cm \cdot x2 \cdot x4} x4 J \frac{x4}{x2} \cdot 1.07961 \cdot \left\{ \right. \\
& 135.730345312 \cdot -0.00205 \cdot -0.0010954451150103322 \cdot H - 0.04 \cdot + 1. \cdot c4L \\
& Cb4. \cdot \bar{a} \cdot -1.41434649220055 \cdot \left\{ \begin{array}{l} \text{APTL}^5 \\ \text{hb} \cdot x4 - \text{ABT} \cdot x2 \cdot x4 \end{array} \right\} \cdot \left\{ \begin{array}{l} \text{|||||} \\ x1 \end{array} \right\} + \frac{0.006 \cdot \left\{ \begin{array}{l} \text{|||||} \\ H100. \cdot + x1L^{0.16} \end{array} \right\}}{\left\{ \right. \\
& J \frac{2.38 \cdot \text{ABT}}{Cb} + \left\{ \begin{array}{l} \text{|||||} \\ Cm \end{array} \right\} x1 J0.453 \cdot + 0.4425 \cdot Cb - 0.2862 \cdot Cm + 0.3696 \cdot Cw - \\
& \frac{0.003467 \cdot x2}{x4} Hx2 + 2. \cdot x4LN \cdot x5^2 \cdot \left\{ \begin{array}{l} \text{|||||} \\ K \end{array} \right\} + 569.2916975592 \cdot \text{ABT}^{1.5} \\
& \bar{a} \cdot \left\{ \begin{array}{l} \text{|||||} \\ K \end{array} \right\} \cdot \frac{0.566326530612214 \cdot \left\{ \begin{array}{l} \text{|||||} \\ K \end{array} \right\}}{-1.5 \cdot \text{hb} \cdot x4} \cdot \left\{ \begin{array}{l} \text{|||||} \\ \text{ABT} \end{array} \right\} - 9.807 \cdot \text{hb} + \\
& 9.807 \cdot x4 + 0.03969110399999999 \cdot x5^2 \cdot \left\{ \begin{array}{l} \text{|||||} \\ \text{MM}^3 \end{array} \right\} \cdot \left\{ \begin{array}{l} \text{|||||} \\ \text{''} \end{array} \right\} \\
& 13.779184373405185 \cdot + 1. \cdot lx5 \cdot \left\{ \begin{array}{l} \text{|||||} \\ \text{I} \end{array} \right\} - 2.45175 \cdot \left\{ \begin{array}{l} \text{|||||} \\ \text{ABT} \end{array} \right\} - 9.807 \cdot \\
& \text{hb} + 9.807 \cdot x4 + 0.03969110399999999 \cdot x5^2 \cdot \left\{ \begin{array}{l} \text{|||||} \\ \text{MM}^2 \end{array} \right\} \cdot \left\{ \begin{array}{l} \text{|||||} \\ \text{M} \end{array} \right\} + \\
& \left\{ \begin{array}{l} \text{|||||} \\ K \end{array} \right\} 10.179775898399999 \cdot \left\{ \begin{array}{l} \text{|||||} \\ K \end{array} \right\} 0.93 \cdot + \frac{\left\{ \begin{array}{l} \text{|||||} \\ H1. \cdot - Cpl^{0.60247} \end{array} \right\}}{\left\{ \begin{array}{l} \text{|||||} \\ K \end{array} \right\}} 0.487118 \cdot \\
& H1. \cdot + 0.011 \cdot Cstern \cdot \left\{ \begin{array}{l} \text{|||||} \\ K \end{array} \right\} \frac{\left\{ \begin{array}{l} \text{|||||} \\ 1. \cdot - Cp + \left\{ \begin{array}{l} \text{|||||} \\ \text{Cp} \end{array} \right\} \end{array} \right\}}{\left\{ \begin{array}{l} \text{|||||} \\ K \end{array} \right\}} 0.121563 \cdot \\
& J \frac{x2}{x1} \cdot 1.06806 \cdot \left\{ \begin{array}{l} \text{|||||} \\ K \end{array} \right\} x1^2 \cdot \left\{ \begin{array}{l} \text{|||||} \\ Cb \cdot x2 \cdot x4 \end{array} \right\} \cdot 0.36486 \cdot J \frac{x4}{x1} \cdot 0.46106 \cdot \left\{ \begin{array}{l} \text{|||||} \\ \text{''} \end{array} \right\} \\
& J \frac{2.38 \cdot \text{ABT}}{Cb} + \left\{ \begin{array}{l} \text{|||||} \\ Cm \end{array} \right\} x1 J0.453 \cdot + 0.4425 \cdot Cb - 0.2862 \cdot Cm + \\
& 0.3696 \cdot Cw - \frac{0.003467 \cdot x2}{x4} Hx2 + 2. \cdot x4LN \cdot x5^2 \cdot \left\{ \begin{array}{l} \text{|||||} \\ \text{''} \end{array} \right\} \\
& H3.6363748627922092 \cdot + 0.43429448190325176 \cdot \text{Log} @ x1 x5DL^2 \cdot \left\{ \begin{array}{l} \text{|||||} \\ \text{''} \end{array} \right\} \cdot \left\{ \begin{array}{l} \text{|||||} \\ \text{''} \end{array} \right\} + \\
& Hx1 \cdot x2 \cdot x3L^{1.003} \cdot L \cdot \left\{ \begin{array}{l} \text{|||||} \\ K \end{array} \right\} 0.6197720682895518 \cdot \\
& Hx1 \cdot x2 \cdot x3L^{0.724} \cdot + \\
& 0.05705477170296265 \cdot H1. \cdot + 0.49532 \cdot CbL \\
& \left\{ \begin{array}{l} \text{|||||} \\ K \end{array} \right\} 1. \cdot + 0.000928 \cdot J - 8.3 \cdot + \frac{x1}{x3} \cdot 1.691 \cdot \left\{ \begin{array}{l} \text{|||||} \\ \text{''} \end{array} \right\}
\end{aligned}$$

$$Hx1 x2 x3L^{1.003} + 0.0011232166043994344$$

$$\left[\begin{array}{c} x5 \\ \hline k \end{array} \right] \left[\begin{array}{c} H90 \\ \hline - \text{hal} \end{array} \right] \left[\begin{array}{c} 1.37565 \\ \hline k \end{array} \right] 2.2366662295036503 \cdot 10c7^{3.78613} Cb$$

$$\bar{a}^{\wedge} - 1.41434649220055 \cdot \left[\begin{array}{c} \text{ABT}^{1.5} \\ \hline \text{hb} - x4 - \text{ABT} x2 x4 \end{array} \right] + \left[\begin{array}{c} 1 \\ \hline \text{XI} \end{array} \right]^{0.9}$$

$$\left[\begin{array}{c} 5.081833302662383 \\ \hline k \end{array} \right] - c16 - \frac{4.79323 \cdot x2}{x1} + \frac{0.0140407 \cdot x1}{x4} -$$

$$\frac{1.75254 \cdot Cb x2 x4}{H Cb x1 x2 x4L^{0.6666666666666667}} + 0 \cdot \bar{a} - \left[\begin{array}{c} 13.8514111555625 \\ \hline \text{XI} \end{array} \right]^{3.29}$$

$$\text{CosB} \frac{-13.34248601399447 + 53.59231882287779 \cdot Cb}{\left[\begin{array}{c} 1 \\ \hline \text{XI} \end{array} \right]} x1$$

$$x2 J1 \cdot \frac{0.8 \cdot \text{AT}}{Cm x2 x4} x4 J \frac{x4}{x2}^{1.07961} + 135.730345312 \cdot \text{AT} c6 x5^{2.} +$$

$$135.730345312 \cdot -0.00205 - 0.0010954451150103322 \cdot H - 0.04 + 1 \cdot c4L$$

$$Cb^4 \cdot \bar{a}^{-1.41434649220055} \cdot \left[\begin{array}{c} \text{ABT}^{1.5} \\ \hline \text{hb} - x4 - \text{ABT} x2 x4 \end{array} \right] \cdot \left[\begin{array}{c} 1 \\ \hline \text{XI} \end{array} \right] + \frac{0.006}{H100 \cdot x1L^{0.16}}$$

$$J \frac{2.38 \cdot \text{ABT}}{Cb} + \left[\begin{array}{c} 1 \\ \hline \text{Cm} \end{array} \right] x1 J0.453 + 0.4425 \cdot Cb - 0.2862 \cdot Cm + 0.3696 \cdot Cw -$$

$$\frac{0.003467 \cdot x2}{x4} Hx2 + 2 \cdot x4LN x5^{2.} + 569.2916975592 \cdot \text{ABT}^{1.5}$$

$$\bar{a} \left[\begin{array}{c} 9.566326570612214 \\ \hline \text{XI} \end{array} \right]^{1.5} \cdot \left[\begin{array}{c} 1 \\ \hline \text{hb} - x4 \end{array} \right] \cdot \left[\begin{array}{c} 1 \\ \hline \text{ABT} \end{array} \right] - 9.807 \cdot \text{hb} +$$

$$9.807 \cdot x4 + 0.0396911039999999 \cdot x5^{2.} \cdot \left[\begin{array}{c} 1 \\ \hline \text{MM} \end{array} \right]^{3.} \cdot$$

$$13.779184373405185 + 1 \cdot \left[\begin{array}{c} 1 \\ \hline \text{lx5} \end{array} \right] \cdot \left[\begin{array}{c} 1 \\ \hline \text{l} \end{array} \right] - 2.45175 \cdot \left[\begin{array}{c} 1 \\ \hline \text{ABT} \end{array} \right] - 9.807 \cdot \text{hb} + 9.807 \cdot x4 + 0.0396911039999999 \cdot x5^{2.} \cdot \left[\begin{array}{c} 1 \\ \hline \text{MM} \end{array} \right]^{2.} \cdot \text{M} +$$

$$\left[\begin{array}{c} 10.179775898399999 \\ \hline k \end{array} \right] \cdot 0.93 + \left[\begin{array}{c} 1 \\ \hline \text{H1} \end{array} \right] - \left[\begin{array}{c} 1 \\ \hline \text{Cpl} \end{array} \right]^{0.60247} \cdot 0.487118$$

$$H1 \cdot + 0.011 \cdot \text{Csternl} \left[\begin{array}{c} 1 \\ \hline \text{I} \end{array} \right] - \left[\begin{array}{c} 1 \\ \hline \text{Cp} \end{array} \right] + \left[\begin{array}{c} 1 \\ \hline \text{Cp} \end{array} \right]^{-1.74} \cdot 0.121563$$

$$J \frac{x2}{x1}^{1.06806} \left[\begin{array}{c} 1 \\ \hline k \end{array} \right] \left[\begin{array}{c} 1 \\ \hline \text{Cb} \end{array} \right] x2 x4 \frac{x1^2}{x4}^{0.36486} J \frac{x4}{x1}^{0.46106} \left[\begin{array}{c} 1 \\ \hline \text{V} \end{array} \right]$$

$$\begin{aligned}
& J \frac{2.38 \text{ ABT}}{\text{Cb}} + \text{Cm} \times 10.453 + 0.4425 \text{ Cb} - 0.2862 \text{ Cm} + \\
& 0.3696 \text{ Cw} - \frac{0.003467 \times 2}{x^4} \text{ Hx}2 + 2 \cdot x4 \text{ LN} x5^2 + \left\{ \begin{array}{l} \text{Y} \\ \text{Z} \end{array} \right\} \\
& \text{H}3.6363748627922092 + 0.43429448190325176 \text{ Log} x1 x5 \text{ DL}^2 \wedge 0.775 + \left\{ \begin{array}{l} \text{Y} \\ \text{Z} \end{array} \right\} \\
& \text{H}0.013673497188513961 \text{ Cb} \text{ Hx}1 x2 x3 \text{ L}^{1.003} \text{ L} \left\{ \begin{array}{l} \text{Y} \\ \text{Z} \end{array} \right\} 0.6197720682895518 \\
& \text{Hx}1 x2 x3 \text{ L}^{0.724} + \\
& 0.05705477170296265 \text{ H}1 + 0.49532 \text{ CbL} \\
& \left\{ \begin{array}{l} \text{J} \\ \text{K} \end{array} \right\} 1 + 0.000928 \text{ J} - 8.3 + \frac{x1^{1.691}}{x3} \left\{ \begin{array}{l} \text{Y} \\ \text{Z} \end{array} \right\} \\
& \text{Hx}1 x2 x3 \text{ L}^{1.003} + 0.0011232166043994344 \\
& \left\{ \begin{array}{l} \text{X}5 \\ \text{K} \end{array} \right\} \left\{ \begin{array}{l} \text{H}90 \\ \text{K} \end{array} \right\} - \text{hal}^{1.37565} \left\{ \begin{array}{l} \text{Y} \\ \text{Z} \end{array} \right\} 2.2366662295036503 \cdot \wedge 10 c7^{3.78613} \text{ Cb} \\
& \left\{ \begin{array}{l} \text{a} \\ \text{K} \end{array} \right\} \wedge - 1.41434649220055 \& \frac{\text{ABT}^{1.5}}{\text{hb} - x4 - \text{ABT} x2 x4} + \left\{ \begin{array}{l} \text{Y} \\ \text{Z} \end{array} \right\} \\
& \left\{ \begin{array}{l} \text{J} \\ \text{K} \end{array} \right\} 5.081833302662383 \left\{ \begin{array}{l} \text{J} \\ \text{K} \end{array} \right\} - c16 - \frac{4.79323 \times 2}{x1} + \frac{0.0140407 \times 1}{x4} - \\
& \frac{1.75254 \text{ Cb} x2 x4}{\text{HCb} x1 x2 x4 \text{ L}^{0.6666666666666667}} \left\{ \begin{array}{l} \text{Y} \\ \text{Z} \end{array} \right\} + 0 \cdot \left\{ \begin{array}{l} \text{a} \\ \text{K} \end{array} \right\} \wedge - \frac{12.95316110595605}{\text{K} x1} \\
& \text{CosB} \frac{-13.34248601399447 + 53.59231882287779 \text{ Cp}}{\text{K} x1} \\
& x2 \text{ J}1 - \frac{0.8 \text{ AT}}{\text{Cm} x2 x4} x4 \text{ J} \frac{x4}{x2} \left\{ \begin{array}{l} \text{Y} \\ \text{Z} \end{array} \right\}^{1.07961} + 135.730345312 \text{ AT} c6 x5^2 + \\
& 135.730345312 \left\{ \begin{array}{l} \text{J} \\ \text{K} \end{array} \right\} - 0.00205 - 0.0010954451150103322 \text{ H} - 0.04 + 1 \cdot c4 \text{ L} \\
& \text{Cb}^4 \cdot \left\{ \begin{array}{l} \text{a} \\ \text{K} \end{array} \right\} - 1.41434649220055 \frac{\text{ABT}^{1.5}}{\text{hb} - x4 - \text{ABT} x2 x4} \cdot \left\{ \begin{array}{l} \text{Y} \\ \text{Z} \end{array} \right\} \frac{0.006}{\text{H}100 + x1 \text{ L}^{0.16}} \\
& J \frac{2.38 \text{ ABT}}{\text{Cb}} + \text{Cm} \times 10.453 + 0.4425 \text{ Cb} - 0.2862 \text{ Cm} + 0.3696 \text{ Cw} - \\
& \frac{0.003467 \times 2}{x^4} \text{ Hx}2 + 2 \cdot x4 \text{ LN} x5^2 + \left\{ \begin{array}{l} \text{Y} \\ \text{Z} \end{array} \right\} 569.2916975592 \text{ ABT}^{1.5}
\end{aligned}$$

$$\begin{aligned}
& \frac{1.75254 \cdot Cb \cdot x^2 \cdot x^4}{H Cb \cdot x^1 \cdot x^2 \cdot x^4} + 0. \cdot \bar{a} \\
& \cos B \frac{-13.34248601399447 + 53.59231882287779 \cdot Cn}{1} \cdot x^1 \\
& x^2 J1. - \frac{0.8 \cdot AT}{Cm \cdot x^2 \cdot x^4} x^4 J \frac{x^4}{x^2} + 135.730345312 \cdot AT \cdot c6 \cdot x5^{2.} + \\
& 135.730345312 \cdot -0.00205 - 0.0010954451150103322 \cdot H - 0.04 + 1. \cdot c4L \\
& Cb^4 \cdot \bar{a} \frac{-1.41434649220055 \cdot \$}{hb \cdot x4 - ABT \cdot x2 \cdot x4} \cdot \frac{0.006}{H100. + x1L^{0.16}} \\
& J \frac{2.38 \cdot ABT}{Cb} + \frac{0.003467 \cdot x^2}{x^4} \cdot Cm \cdot x1 J0.453 + 0.4425 \cdot Cb - 0.2862 \cdot Cm + 0.3696 \cdot Cw - \\
& \frac{0.003467 \cdot x^2}{x^4} Hx2 + 2. \cdot x4LN \cdot x5^{2.} + 569.2916975592 \cdot ABT^{1.5} \\
& \bar{a} \frac{-0.566236596102145}{k^{-1.5} \cdot hb \cdot x^4} \cdot lx5 \cdot l' \cdot l - 2.45175 \cdot \cdot ABT - 9.807 \cdot hb + \\
& 9.807 \cdot x4 + 0.03969110399999999 \cdot x5^{2.} \cdot MM^3 \cdot \\
& 13.779184373405185 + 1. \cdot lx5 \cdot l' \cdot l - 2.45175 \cdot \cdot ABT - 9.807 \cdot \\
& hb + 9.807 \cdot x4 + 0.03969110399999999 \cdot x5^{2.} \cdot MM^2 \cdot M + \\
& 10.179775898399999 \cdot 0.93 + \frac{H1. - Cpl^{0.6024}}{1. - Cp + -1. + 4. \cdot Cp} \cdot 0.487118 \\
& H1. + 0.011 \cdot Csternl \cdot \frac{0.121563}{1. - Cp + -1. + 4. \cdot Cp} \\
& J \frac{x^2}{x^1} \cdot 1.06806 \cdot J \frac{x^{12.}}{Cb \cdot x^2 \cdot x^4} \cdot 0.36486 \cdot J \frac{x^4}{x^1} \cdot 0.46106 \cdot \\
& J \frac{2.38 \cdot ABT}{Cb} + \frac{0.003467 \cdot x^2}{x^4} \cdot Cm \cdot x1 J0.453 + 0.4425 \cdot Cb - 0.2862 \cdot Cm + \\
& 0.3696 \cdot Cw - \frac{0.003467 \cdot x^2}{x^4} Hx2 + 2. \cdot x4LN \cdot x5^{2.} + \\
& H3.6363748627922092 + 0.43429448190325176 \cdot \text{Log}@x1 \cdot x5DL^{2.} \cdot ^{0.775} +
\end{aligned}$$

$$\frac{0.000012689005390940957 \cdot \text{Cb} \cdot J - 8.3}{x^5} + \frac{x^{1.691}}{x^3} \cdot \text{Hx1} \cdot x^2 \cdot x^3 \cdot 1.003 \cdot \frac{y}{z}$$

$$0.6197720682895518$$

$$\text{Hx1} \cdot x^2 \cdot x^3 \cdot 1.724 + 0.05705477170296265 \cdot \text{H1} + 0.49532 \cdot \text{CbL}$$

$$\frac{1}{x} + 0.000928 \cdot J - 8.3 + \frac{x^{1.691}}{x^3} \cdot \frac{y}{z}$$

$$\text{Hx1} \cdot x^2 \cdot x^3 \cdot 1.003 + 0.0011232166043994344$$

$$\frac{x^5}{x} \cdot \frac{\text{H90} - \text{hal}^{1.37565}}{x} \cdot 2.2366662295036503 \cdot *^{\wedge} 10 \cdot c^7 \cdot 3.78613 \cdot \text{Cb}$$

$$\frac{\bar{a}^{\wedge}}{x} - 1.41434649220055 \cdot \& \cdot \frac{\text{ABT}^{1.5}}{\text{hb} - x^4 - \text{ABT} \cdot x^2 \cdot x^4} + \frac{1}{x^2}$$

$$\frac{5.081833302662383}{x} - c16 - \frac{4.79323 \cdot x^2}{x^1} + \frac{0.0140407 \cdot x^1}{x^4}$$

$$\frac{1.75254 \cdot \text{Cb} \cdot x^2 \cdot x^4}{\text{HCb} \cdot x^1 \cdot x^2 \cdot x^4 \cdot 0.6666666666666667} \cdot \frac{y}{z} + 0 \cdot \bar{a} - \frac{12.95316110595605}{x^2}$$

$$\text{CosB} \cdot \frac{-13.34248601399447 + 53.59231882287779 \cdot \text{Cp}}{x^1}$$

$$x^2 \cdot J^1 - \frac{0.8 \cdot \text{AT}}{\text{Cm} \cdot x^2 \cdot x^4} \cdot x^4 \cdot J \cdot \frac{x^4}{x^2} \cdot 1.07961 \cdot \frac{y}{z} + 135.730345312 \cdot \text{AT} \cdot c^6 \cdot x^5 \cdot 2 +$$

$$135.730345312 - 0.00205 - 0.0010954451150103322 \cdot \text{H} - 0.04 + 1 \cdot c^4$$

$$\text{Cb}^4 \cdot \bar{a} - 1.41434649220055 \cdot \frac{\text{ABT}^{1.5}}{\text{hb} - x^4 - \text{ABT} \cdot x^2 \cdot x^4} \cdot \frac{1}{x^1} + \frac{0.006}{\text{H}100 + x^1 \cdot 0.16}$$

$$\frac{2.38 \cdot \text{ABT}}{\text{Cb}} + \frac{1}{\text{Cm}} \cdot x^1 \cdot J \cdot 0.453 + 0.4425 \cdot \text{Cb} - 0.2862 \cdot \text{Cm} + 0.3696 \cdot \text{Cw} -$$

$$\frac{0.003467 \cdot x^2}{x^4} \cdot \text{Hx2} + 2 \cdot x^4 \cdot \text{LN} \cdot x^5 \cdot 2 + 569.2916975592 \cdot \text{ABT}^{1.5}$$

$$\bar{a} \cdot \frac{-0.566226520612214}{x^1 \cdot 1.5 \cdot \text{hb} \cdot x^4} \cdot \text{Ix5} \cdot \text{I} - 2.45175 \cdot \frac{1}{\text{ABT}} - 9.807 \cdot \text{hb} +$$

$$9.807 \cdot x^4 + 0.03969110399999999 \cdot x^5 \cdot 2 \cdot \text{MM}^{\wedge} 3 \cdot \frac{y}{z}$$

$$13.779184373405185^{\circ} + 1.1 \times 5^{\circ} \cdot \text{ABT} - 9.807^{\circ} \\ \text{hb} + 9.807^{\circ} x4 + 0.03969110399999999^{\circ} x5^2 \cdot \text{MM}^{\wedge} 2.2^{\circ} \text{M} +$$

$$10.179775898399999^{\circ} \cdot 0.93^{\circ} + \text{H1.}^{\circ} - \text{Cpl}^{0.6024^{\circ}} \cdot 0.487118^{\circ}$$

$$\text{H1.}^{\circ} + 0.011^{\circ} \text{CsternL} \cdot 1.1^{\circ} - \text{Cp} + \text{Cp}^{0.121563^{\circ}}$$

$$\text{J}^{1.06806^{\circ}} \cdot \text{x1} \cdot \text{Cb} \cdot \text{x2} \cdot \text{x4} \cdot 0.36486^{\circ} \cdot \text{J}^{0.46106^{\circ}} \cdot \text{x1}$$

$$\frac{2.38^{\circ} \text{ABT}}{\text{Cb}} + \text{Cm} \cdot \text{x1} \cdot 0.453^{\circ} + 0.4425^{\circ} \text{Cb} - 0.2862^{\circ} \text{Cm} +$$

$$0.3696^{\circ} \text{Cw} - \frac{0.003467^{\circ} \cdot \text{x2}}{\text{x4}} \cdot \text{Hx2} + 2.1^{\circ} \cdot \text{x4LN} \cdot \text{x5}^2$$

$$\text{H3.6363748627922092}^{\circ} + 0.43429448190325176^{\circ} \text{Log} \cdot \text{x1} \cdot \text{x5DL}^2 \cdot 0.775^{\circ} +$$

$$0.00007332679259264761^{\circ} \cdot \text{J}^{1.003^{\circ}} \cdot \text{Hx1} \cdot \text{x2} \cdot \text{x3L}^{1.003^{\circ}}$$

$$0.6197720682895518^{\circ}$$

$$\text{Hx1} \cdot \text{x2} \cdot \text{x3L}^{0.724^{\circ}} +$$

$$0.05705477170296265^{\circ}$$

$$\text{H1.}^{\circ} + 0.49532^{\circ} \text{CbL}$$

$$1.1^{\circ} + 0.000928^{\circ} \text{J} - 8.3^{\circ} + \text{J}^{1.691^{\circ}} \cdot \text{x3}$$

$$\text{Hx1} \cdot \text{x2} \cdot \text{x3L}^{1.003^{\circ}} +$$

$$0.0011232166043994344^{\circ}$$

$$\text{H90.}^{\circ} - \text{hal}^{1.37565^{\circ}} \cdot 2.2366662295036503^{\circ} \cdot 10 \cdot c7^{3.78613^{\circ}} \text{Cb}$$

$$\bar{a}^{\wedge} 3 - 1.41434649220055^{\circ} \cdot \text{hb} - \text{x4} - \frac{\text{ABT}^{1.5^{\circ}}}{\text{ABT} \cdot \text{x2} \cdot \text{x4}} + \frac{1}{\text{x1}}$$

$$5.081833302662383^{\circ} \cdot \text{c16} - \frac{4.79323^{\circ} \cdot \text{x2}}{\text{x1}} + \frac{0.0140407^{\circ} \cdot \text{x1}}{\text{x4}} -$$

$$\frac{1.75254^{\circ} \text{Cb} \cdot \text{x2} \cdot \text{x4}}{\text{HCb} \cdot \text{x1} \cdot \text{x2} \cdot \text{x4L}^{0.6666666666666666^{\circ}}} + 0.1^{\circ} \bar{a} - \frac{12.052161110505605^{\circ}}{\text{x1}}$$

$$\text{CosB} - \frac{13.34248601399447^{\circ} + 53.59231882287779^{\circ} \text{Cp}}{\text{x1}}$$

$$\begin{aligned}
& x^2 J_1 - \frac{0.8 \text{ AT}}{C_m x^2 x^4} x^4 J \frac{x^4}{x^2}^{1.07961} + 135.730345312 \text{ AT} c_6 x^5{}^2 + \\
& 135.730345312 - 0.00205 - 0.0010954451150103322 \text{ H} - 0.04 + 1. \text{ c}4L \\
& C_b^4 \bar{a}^{-1.41434649220055} \frac{\text{AT}^{1.5}}{h_b x^4 - \text{ABT} x^2 x^4} \cdot \frac{\text{H}}{x^1} + \frac{0.006}{\text{H}100. + x^1 L^{0.16}} \\
& J \frac{2.38 \text{ ABT}}{C_b} + \frac{\text{H}}{C_m} x^1 J_0.453 + 0.4425 \text{ C}_b - 0.2862 \text{ C}_m + 0.3696 \text{ C}_w - \\
& \frac{0.003467 x^2}{x^4} \text{ H} x^2 + 2. x^4 L N x^5{}^2 + 569.2916975592 \text{ ABT}^{1.5} \\
& \bar{a} \frac{-0.566326530612214}{k^{-1.5} h_b x^4} \{ l x^5 \text{ l} \text{ l} - 2.45175 \cdot \frac{\text{H}}{\text{ABT}} - 9.807 \text{ h}_b + \\
& 9.807 x^4 + 0.03969110399999999 x^5{}^2 \text{ M}^3 \} \\
& 13.779184373405185 + 1. l x^5 \text{ l} \text{ l} - 2.45175 \cdot \frac{\text{H}}{\text{ABT}} - 9.807 \\
& h_b + 9.807 x^4 + 0.03969110399999999 x^5{}^2 \text{ M}^2 \} \\
& 10.179775898399999 \cdot 0.93 + \frac{\text{H}}{\text{H}1. - \text{C}_p} \frac{0.487118}{\text{C}_p} \\
& \text{H}1. + 0.011 \text{ C}_s \text{tern} \frac{0.121563}{1. - \text{C}_p + \frac{\text{H}}{\text{C}_p}} \\
& J \frac{x^2}{x^1}^{1.06806} \frac{x^1}{C_b x^2 x^4}^{2.} \frac{0.36486}{x^1} \frac{0.46106}{x^1} \\
& J \frac{2.38 \text{ ABT}}{C_b} + \frac{\text{H}}{C_m} x^1 J_0.453 + 0.4425 \text{ C}_b - 0.2862 \text{ C}_m + \\
& 0.3696 \text{ C}_w - \frac{0.003467 x^2}{x^4} \text{ H} x^2 + 2. x^4 L N x^5{}^2 \\
& \text{H}3.6363748627922092 + 0.43429448190325176 \text{ Log} x^1 x^5 D^{2.} \wedge 0.775 - \\
& 0.00004994658790788932 \text{ C}_b J \frac{x^1}{x^3}^{2.} \text{ H} x^1 x^2 x^3 L^{1.003} \\
& 0.6197720682895518 \\
& \text{H} x^1 x^2 x^3 L^{0.724} + \\
& 0.05705477170296265
\end{aligned}$$

$$\begin{aligned}
& H1. \cdot + 0.011 \cdot Csternl \left\{ \begin{array}{l} 1. \cdot - Cp + \\ -1. \cdot +4. \cdot Cp \end{array} \right\}^{0.121563} \\
& J \frac{x^2}{x1} \left\{ \begin{array}{l} 1.06806 \cdot \\ \\ \end{array} \right\} j \frac{x1^2}{Cb x2 x4} \left\{ \begin{array}{l} 0.36486 \cdot \\ \\ \end{array} \right\} J \frac{x4}{x1} \left\{ \begin{array}{l} 0.46106 \cdot \\ \\ \end{array} \right\} \\
& J \frac{2.38 \cdot ABT}{Cb} + \cdot C_m x1 J 0.453 \cdot + 0.4425 \cdot Cb - 0.2862 \cdot C_m + \\
& 0.3696 \cdot Cw - \frac{0.003467 \cdot x^2}{x4} Hx2 + 2. \cdot x4 Lx5^2 \cdot \\
& H3.6363748627922092 \cdot + 0.43429448190325176 \cdot \text{Log} x1 x5 D^{2.} \wedge^{0.775} - \\
& 0.00004272967871410613 \cdot Cb^2 J \frac{x1}{x5} \left\{ \begin{array}{l} 2. \cdot \\ \\ \end{array} \right\} Hx1 x2 x3 L^{1.003} \cdot \\
& 0.6197720682895518 \cdot \\
& Hx1 x2 x3 L^{0.724} + \\
& 0.05705477170296265 \cdot \\
& H1. \cdot + 0.49532 \cdot Cbl \\
& j \frac{1. \cdot + 0.000928 \cdot J - 8.3 \cdot + \frac{x1}{x3} \left\{ \begin{array}{l} 1.691 \cdot \\ \\ \end{array} \right\}}{k} \\
& Hx1 x2 x3 L^{1.003} + \\
& 0.0011232166043994344 \cdot \\
& H90. \cdot - hal^{1.37565} \left\{ \begin{array}{l} 2.2366662295036503 \cdot * \wedge^{10} c7^{3.78613} \cdot Cb \\ \\ \end{array} \right\} \\
& \bar{a} \wedge^3 - 1.41434649220055 \cdot \& \left\{ \begin{array}{l} ABT^{1.5} \cdot \\ hb - x4 - \cdot ABT x2 x4 \\ \frac{1}{x1} \end{array} \right\} \\
& j \frac{5.081833302662383 \cdot}{k} - c16 - \frac{4.79323 \cdot x^2}{x1} + \frac{0.0140407 \cdot x1}{x4} - \\
& HCb x1 x2 x4 L^{0.6666666666666667} \left\{ \begin{array}{l} 1.75254 \cdot Cb x2 x4 \\ \\ \end{array} \right\} + 0. \cdot \bar{a} \left\{ \begin{array}{l} -12.953161110595605 \cdot \\ \\ \end{array} \right\} \\
& CosB \frac{-13.34248601399447 \cdot + 53.59231882287779 \cdot Cp}{x1} \\
& x2 J1. \cdot - \frac{0.8 \cdot AT}{Cm x2 x4} x4 J \frac{x4}{x2} \left\{ \begin{array}{l} 1.07961 \cdot \\ \\ \end{array} \right\} + 135.730345312 \cdot AT c6 x5^2 \cdot +
\end{aligned}$$

0.0011232166043994344`

$$\left(\frac{1}{k} \right)^{x5} \left(\frac{1}{k} \right)^{H90} - \text{hal}^{1.37565} \left(\frac{1}{k} \right)^{2.2366662295036503} * 10 c 7^{3.78613} Cb$$

$$\bar{a}^{\wedge 3} - 1.41434649220055` \& \left(\frac{1}{k} \right)^{hb - x4 - \left(\frac{1}{k} \right)^{ABT^{1.5}} x2 x4} + \left(\frac{1}{k} \right)^{0.9}$$

$$\left(\frac{1}{k} \right)^{5.081833302662383} - c16 - \left(\frac{1}{k} \right)^{\frac{4.79323` x2}{x1}} + \left(\frac{1}{k} \right)^{\frac{0.0140407` x1}{x4}}$$

$$\left(\frac{1}{k} \right)^{\frac{1.75254` Cb x2 x4}{H Cb x1 x2 x4 L^{0.6666666666666667}}} + 0.` \bar{a} - \left(\frac{1}{k} \right)^{13.85514111555625}$$

$$\text{Cos} \left(\frac{1}{k} \right)^{-13.34248601399447` + 53.59231882287779` C p} x1$$

$$x2 J1.` - \left(\frac{1}{k} \right)^{\frac{0.8` AT}{C m x2 x4}} x4 J \left(\frac{1}{k} \right)^{\frac{1.07961`}{x2}} + 135.730345312` AT c6 x5^{2.} +$$

$$135.730345312` - 0.00205` - 0.0010954451150103322` H - 0.04` + 1.` c4L$$

$$Cb^4.` \bar{a}^{-1.41434649220055` \$ \left(\frac{1}{k} \right)^{hb - x4 - \left(\frac{1}{k} \right)^{ABT^{1.5}} x2 x4} \cdot \left(\frac{1}{k} \right)^{0.006`}} + \left(\frac{1}{k} \right)^{H100.` + x1L^{0.16}}$$

$$J \left(\frac{1}{k} \right)^{\frac{2.38` ABT}{Cb}} + \left(\frac{1}{k} \right)^{C m^3 x1 J0.453` + 0.4425` Cb - 0.2862` Cm + 0.3696` Cw -$$

$$\left(\frac{1}{k} \right)^{\frac{0.003467` x2}{x4}} H x2 + 2.` x4 L N x5^{2.} + \left(\frac{1}{k} \right)^{569.2916975592` ABT^{1.5}}$$

$$\bar{a} \left(\frac{1}{k} \right)^{\frac{9.5663265706122145`}{1.5 hb x4}} \left(\frac{1}{k} \right)^{lx5` l' l - 2.45175` \cdot \left(\frac{1}{k} \right)^{ABT} - 9.807` hb +$$

$$9.807` x4 + 0.03969110399999999` x5^{2.} M M M^3.` M$$

$$13.779184373405185` + 1.` lx5` l' l - 2.45175` \cdot \left(\frac{1}{k} \right)^{ABT} - 9.807` hb + 9.807` x4 + 0.03969110399999999` x5^{2.} M M M^2.` M +$$

$$\left(\frac{1}{k} \right)^{10.179775898399999` 0.93` + \left(\frac{1}{k} \right)^{H1.` - C p l^{0.60247}} \left(\frac{1}{k} \right)^{0.487118`}$$

$$H1.` + 0.011` Csternl \left(\frac{1}{k} \right)^{I.` - C p + \left(\frac{1}{k} \right)^{-1.74. C p}}^{0.121563}$$

$$J \left(\frac{1}{k} \right)^{\frac{1.06806`}{x1}} \left(\frac{1}{k} \right)^{\frac{1.2`}{x1}} \left(\frac{1}{k} \right)^{\frac{0.36486`}{x1}} \left(\frac{1}{k} \right)^{\frac{0.46106`}{x1}} W W$$

$$\begin{aligned}
& \frac{2.38 \text{ ABT}}{\text{Cb}} + \frac{\text{Cm}}{\text{Cm}} \times 10.453 + 0.4425 \text{ Cb} - 0.2862 \text{ Cm} + \\
& 0.3696 \text{ Cw} - \frac{0.003467 \times 2}{x^4} \text{ Hx}^2 + 2. \times 4 \text{ LN} \times 5^2 \cdot \\
& \text{H}3.6363748627922092 + 0.43429448190325176 \text{ Log} \times 1 \times 5 \text{DL}^2 \cdot \wedge 0.775 - \\
& \sqrt[4]{4.635043357852129} \cdot \wedge - 8 \text{ Cb} \text{J} - 8.3 + \frac{x^1}{x^3} \cdot 1.691 \cdot \frac{x^1}{x^3} \cdot 2. \\
& \text{Hx}^1 \times 2 \times 3 \text{L}^{1.003} \cdot \\
& \sqrt[4]{0.6197720682895518} \text{ Hx}^1 \times 2 \times 3 \text{L}^{0.724} + \\
& 0.05705477170296265 \cdot \\
& \text{H}1. + 0.49532 \text{ CbL} \\
& \sqrt[4]{1. + 0.000928 \text{J} - 8.3} + \frac{x^1}{x^3} \cdot 1.691 \cdot \\
& \text{Hx}^1 \times 2 \times 3 \text{L}^{1.003} + \\
& 0.0011232166043994344 \cdot \\
& \sqrt[4]{x^5} \cdot \sqrt[4]{\text{H}90. - \text{haL}^{1.57565}} \cdot 2.2366662295036503 \cdot \wedge 10 \text{c}7^{3.78613} \text{ Cb} \\
& \sqrt[4]{\bar{a}} - 1.41434649220055 \cdot \frac{\text{ABT}^{1.5}}{\text{hb} - x^4 - \text{ABT} \times 2 \times 4} + \frac{1}{\sqrt[4]{\text{XT}}} \\
& \sqrt[4]{5.081833302662383} \cdot \sqrt[4]{-c16} - \frac{4.79323 \times 2}{x^1} + \frac{0.0140407 \times 1}{x^4} - \\
& \frac{1.75254 \text{ Cb} \times 2 \times 4}{\text{HCb} \times 1 \times 2 \times 4 \text{L}^{0.6666666666666667}} \cdot \frac{\text{wv}}{\sqrt[4]{\text{XT}}} + 0. \bar{a} \cdot \sqrt[4]{\frac{-12.052161110895605}{\text{XT}}} \\
& \text{CosB} \cdot \frac{-13.34248601399447 + 53.59231882287779 \text{ Cb}}{\sqrt[4]{\text{XT}}} \cdot \sqrt[4]{x1} \\
& x2 \text{J}1. - \frac{0.8 \text{ AT}}{\text{Cm} \times 2 \times 4} \times 4 \text{J} \cdot \frac{x^4}{x^2} \cdot 1.07961 \cdot \sqrt[4]{\text{XT}} + 135.730345312 \text{ AT} \text{c}6 \times 5^2 + \\
& 135.730345312 \cdot \sqrt[4]{-0.00205} - 0.0010954451150103322 \text{ H} - 0.04 + 1. \text{c}4 \text{L} \\
& \text{Cb}^4 \cdot \bar{a} - 1.41434649220055 \cdot \frac{\text{ABT}^{1.5}}{\text{hb} - x^4 - \text{ABT} \times 2 \times 4} \cdot \frac{\text{Cm}}{\text{Cm}} \times 1 + \frac{0.006}{\text{H}100. + x1 \text{L}^{0.16}} \cdot \sqrt[4]{\text{XT}}
\end{aligned}$$

$$\begin{aligned}
& \frac{2.38 \text{ ABT}}{C_b} + C_m \times 10.453 + 0.4425 C_b - 0.2862 C_m + 0.3696 C_w - \\
& \frac{0.003467 x^2}{x^4} Hx^2 + 2. x4LN x5^2 + 569.2916975592 \text{ ABT}^{1.5} \\
& \bar{a} \frac{-0.566236570612214}{k=1.5 \text{ hb} \times x^4} \{ l x 5' |' | - 2.45175 \cdot \text{ABT} - 9.807 \text{ hb} + \\
& 9.807 x^4 + 0.0396911039999999 x5^2 \} \\
& 13.779184373405185 + 1. l x 5' |' | - 2.45175 \cdot \text{ABT} - 9.807 \\
& \text{hb} + 9.807 x^4 + 0.0396911039999999 x5^2 \\
& 10.179775898399999 \cdot 0.93 + \frac{H1. - Cpl^{0.60247}}{k} 0.487118 \\
& H1. + 0.011 Cstern \frac{1. - Cp + -1. +4. Cp}{k} \}^{0.121563} \\
& \frac{J x^2}{x1} \frac{1.06806}{k} \frac{J x1^2}{C_b x2 x4} \frac{0.36486}{k} \frac{J x4}{x1} \frac{0.46106}{k} \\
& \frac{2.38 \text{ ABT}}{C_b} + C_m \times 10.453 + 0.4425 C_b - 0.2862 C_m + \\
& 0.3696 C_w - \frac{0.003467 x^2}{x^4} Hx^2 + 2. x4LN x5^2 \\
& H3.6363748627922092 + 0.43429448190325176 \text{ Log} \times 1 x5DL^{2.775} \\
& \frac{3.965314184669049 \cdot 8 Cb^2 J - 8.3}{x3} + \frac{1.691}{x3} \frac{J x1}{x3} \\
& Hx1 x2 x3L^{1.003} \\
& 0.6197720682895518 Hx1 x2 x3L^{0.724} + \\
& 0.05705477170296265 \\
& H1. + 0.49532 CbL \\
& \frac{1. + 0.000928 J - 8.3}{k} + \frac{1.691}{x3} \frac{J x1}{x3} \\
& Hx1 x2 x3L^{1.003} + \\
& 0.0011232166043994344 \\
& \frac{x5}{k} \frac{H90. - hal^{1.37565}}{k} 2.2366662295036503 \cdot 10c7^{3.78613} C_b
\end{aligned}$$

$$\begin{aligned}
& \bar{a}^k - 1.41434649220055 \cdot \frac{ABT^{1.5}}{hb - x^4 - ABT x^2 x^4} + \frac{1}{x^1} \\
& \int_k \left[5.081833302662383 \int_k - c16 - \frac{4.79323 x^2}{x^1} + \frac{0.0140407 x^1}{x^4} - \right. \\
& \quad \left. \frac{1.75254 Cb x^2 x^4}{H Cb x^1 x^2 x^4} + 0 \cdot \bar{a} \right] \\
& \text{CosB} = \frac{-13.34248601399447 + 53.59231882287779 C_p}{x^1} \\
& x^2 J_1 = - \frac{0.8 AT}{C_m x^2 x^4} x^4 J \frac{x^4}{x^2} + 135.730345312 AT c_6 x^5^2 + \\
& 135.730345312 - 0.00205 - 0.0010954451150103322 H - 0.04 + 1 \cdot c_4 L \\
& C_b^4 \bar{a} = -1.41434649220055 \cdot \frac{ABT^{1.5}}{hb - x^4 - ABT x^2 x^4} \cdot \frac{1}{x^1} + \frac{0.006}{H100 + x^1} \\
& J \frac{2.38 ABT}{C_b} + \frac{1}{C_m} x^1 J 0.453 + 0.4425 C_b - 0.2862 C_m + 0.3696 C_w - \\
& \quad \frac{0.003467 x^2}{x^4} H x^2 + 2 \cdot x^4 L N x^5^2 + 569.2916975592 ABT^{1.5} \\
& \bar{a} = \frac{-9.566326520612214}{x^1} l x^5 + l - 2.45175 \cdot ABT - 9.807 hb + \\
& \quad 9.807 x^4 + 0.0396911039999999 x^5^2 \\
& 13.779184373405185 + 1 \cdot l x^5 + l - 2.45175 \cdot ABT - 9.807 \\
& \quad hb + 9.807 x^4 + 0.0396911039999999 x^5^2 \\
& 10.179775898399999 \int_k 0.93 + \frac{1}{H_1 - C_p} \int_k 0.487118 \\
& H_1 + 0.011 C_{stern} \int_k \frac{1}{1 - C_p} + \frac{0.121563}{-1 + C_p} \\
& J \frac{x^2}{x^1} \int_k \frac{1.06806}{x^1} \int_k \frac{x^1}{C_b x^2 x^4} \int_k \frac{0.36486}{x^1} \int_k \frac{0.46106}{x^1} \\
& J \frac{2.38 ABT}{C_b} + \frac{1}{C_m} x^1 J 0.453 + 0.4425 C_b - 0.2862 C_m + \\
& \quad 0.3696 C_w - \frac{0.003467 x^2}{x^4} H x^2 + 2 \cdot x^4 L N x^5^2
\end{aligned}$$

$$\begin{aligned}
& 3.6363748627922092 + 0.43429448190325176 \operatorname{Log} x + 50L^{2.775} + \\
& 0.0005279118040677341 x^{5.1} \left(\frac{1}{90} - \frac{1}{3.7565} \right) + 2.2366662295036503 \cdot 10 c_7^{3.78613} \\
& C_b \bar{a} - 1.41434649220055 \cdot \left(\frac{ABT^{1.5}}{hb - x^4 - ABT^2 x^4} + \frac{1}{x^{1.9}} \right) \\
& \left(5.081833302662383 \right) x^{-c16} - \frac{4.79323 x^2}{x^1} + \frac{0.0140407 x^1}{x^4} - \\
& \frac{1.75254 C_b x^2 x^4}{HC_b x^1 x^2 x^4} + 0. \bar{a} \left(\frac{-13.052161140505695}{x^{1.2}} \right) \\
& \cos B \left(\frac{-13.34248601399447 + 53.59231882287779 C_p}{x^1} \right) \\
& x^2 J_1 - \frac{0.8 AT}{C_m x^2 x^4} x^4 J \frac{x^4}{x^2}^{1.07961} + 135.730345312 AT c_6 x^{5^2} + \\
& 135.730345312 \left(-0.00205 - 0.0010954451150103322 H - 0.04 + 1. c_{4L} \right) \\
& C_b^4 \bar{a}^{-1.41434649220055} \cdot \left(\frac{ABT^{1.5}}{hb - x^4 - ABT^2 x^4} \right) \cdot \frac{1}{x^{1.1}} + \frac{0.006}{H_{100} + x^{1L^{0.16}}} \\
& J \frac{2.38 ABT}{C_b} + C_m x^1 J 0.453 + 0.4425 C_b - 0.2862 C_m + \\
& 0.3696 C_w - \frac{0.003467 x^2}{x^4} H x^2 + 2. x^4 L x^{5^2} + \\
& 569.2916975592 ABT^{1.5} \bar{a} \left(\frac{-0.5662265202246}{x^{1.5}} \right) \left(x^5 + 1 \right) - 2.45175 \cdot \frac{1}{ABT} - 9.807 \\
& hb + 9.807 x^4 + 0.03969110399999999 x^{5^2} MM^3 \\
& 13.779184373405185 + 1. \left(x^5 + 1 \right) - 2.45175 \cdot \frac{1}{ABT} - 9.807 hb + \\
& 9.807 x^4 + 0.03969110399999999 x^{5^2} MM^2 M + \\
& 10.179775898399999 \left(0.93 + \frac{1}{H_1 - C_{pl}} \right) \frac{1}{x^{0.6024}} + 0.487118 \\
& H_1 + 0.011 C_{stern} \left(\frac{1}{x} - C_p + \frac{1}{-1.44 C_b} \right)^{0.121563}
\end{aligned}$$

$$\begin{aligned}
& \left(\frac{x^2}{x^1} \right)^{1.06806} \cdot \left(\frac{x^1}{k C_b x^2 x^4} \right)^{0.36486} \cdot \left(\frac{x^4}{x^1} \right)^{0.46106} \cdot \left(\frac{2.38 \cdot \text{ABT}}{C_b} + C_m \cdot x^1 \right) \cdot \left(0.453 \cdot C_b - 0.2862 \cdot C_m + \right. \\
& \left. 0.3696 \cdot C_w - \frac{0.003467 \cdot x^2}{x^4} \cdot H_x + 2 \cdot x^4 \cdot L_N \cdot x^5 \right) \\
& \left(3.6363748627922092 + 0.43429448190325176 \cdot \text{Log} \left(x^1 \cdot x^5 \right)^{0.775} \right)
\end{aligned}$$

$$0.6197720682895518 \cdot H_x \cdot x^2 \cdot x^3 \cdot L^{0.724} + 0.05705477170296265 \cdot H_1 + 0.49532 \cdot C_b L$$

$$\left(\frac{x^1}{k} \right)^{1.691} \cdot \left(\frac{x^1}{x^3} \right)^{1.003} + H_x \cdot x^2 \cdot x^3 \cdot L^{1.003} + 0.0011232166043994344 \cdot$$

$$\left(\frac{x^5}{k} \right)^{1.37565} \cdot 2.2366662295036503 \cdot 10^7 \cdot c^{7.78613} \cdot C_b$$

$$\begin{aligned}
& \bar{a}^{-1.41434649220055} \cdot \left(\frac{\text{ABT}^{1.5}}{h_b - x^4 - \text{ABT} \cdot x^2 \cdot x^4} + \frac{1}{x^1} \right) \\
& \left(\frac{x^5}{k} \right)^{4.79323} \cdot \left(\frac{x^2}{x^1} \right)^{0.0140407} \cdot \left(\frac{x^1}{x^4} \right)^{-12.95316110595605} \\
& \left(\frac{1.75254 \cdot C_b \cdot x^2 \cdot x^4}{H C_b \cdot x^1 \cdot x^2 \cdot x^4} \right)^{0.6666666666666667} + 0 \cdot \bar{a}
\end{aligned}$$

$$\text{CosB} \cdot \left(-13.34248601399447 + 53.59231882287779 \cdot C_p \right) \cdot x^1$$

$$x^2 \cdot J_1 \cdot \left(\frac{0.8 \cdot \text{AT}}{C_m \cdot x^2 \cdot x^4} \right) \cdot \left(\frac{x^4}{x^2} \right)^{1.07961} + 135.730345312 \cdot \text{AT} \cdot c^6 \cdot x^5 \cdot x^2 +$$

$$135.730345312 \cdot \left(-0.00205 - 0.0010954451150103322 \cdot H - 0.04 \cdot x^1 + c^4 L \right)$$

$$C_b^4 \cdot \bar{a}^{-1.41434649220055} \cdot \left(\frac{\text{ABT}^{1.5}}{h_b - x^4 - \text{ABT} \cdot x^2 \cdot x^4} \right) \cdot \left(\frac{1}{x^1} \right) + \left(\frac{0.006}{H_{100} + x^1} \right)^{0.16}$$

$$\left(\frac{2.38 \cdot \text{ABT}}{C_b} + C_m \cdot x^1 \right) \cdot \left(0.453 \cdot C_b - 0.2862 \cdot C_m + 0.3696 \cdot C_w - \frac{0.003467 \cdot x^2}{x^4} \cdot H_x + 2 \cdot x^4 \cdot L_N \cdot x^5 \right)$$

$$\begin{aligned}
& \frac{0.003467 \cdot x^2}{x^4} \ln x^2 + 2 \cdot x^4 \ln x^5 + 569.2916975592 \cdot \text{ABT}^{1.5} \\
& - \frac{0.566226539612214}{x^4} \ln x^4 \\
& \bar{a} \cdot \ln x^5 \cdot |x^5 - 1| - 2.45175 \cdot \text{ABT} - 9.807 \cdot \text{hb} + \\
& 9.807 \cdot x^4 + 0.03969110399999999 \cdot x^5 + 3.779184373405185 + 1 \cdot |x^5 - 1| - 2.45175 \cdot \text{ABT} - 9.807 \cdot \text{hb} \\
& + 9.807 \cdot x^4 + 0.03969110399999999 \cdot x^5 + 10.179775898399999 \cdot 0.93 + \text{HL} - \text{Cpl}^{0.60247} \cdot 0.487118 \\
& \text{HL} + 0.011 \cdot \text{Cstern} \cdot \ln x^2 - \text{Cp} + \text{Cp}^{0.121563} \\
& \frac{x^2}{x^1} \cdot 1.06806 \cdot \ln x^2 - \frac{x^2}{x^4} \cdot 0.36486 \cdot \ln x^4 + \frac{x^4}{x^1} \cdot 0.46106 \cdot \ln x^4 \\
& \frac{2.38 \cdot \text{ABT}}{\text{Cb}} + \text{Cm} \cdot x^1 \cdot 0.453 + 0.4425 \cdot \text{Cb} - 0.2862 \cdot \text{Cm} + \\
& 0.3696 \cdot \text{Cw} - \frac{0.003467 \cdot x^2}{x^4} \ln x^2 + 2 \cdot x^4 \ln x^5 \\
& 3.6363748627922092 + 0.43429448190325176 \cdot \text{Log} x^1 \cdot x^5 \ln^{0.775}
\end{aligned}$$

Appendix J

Mathematical Form of the Fuel Weight

Wf =

$$0.00041414026809651473 \cdot \frac{\text{Cm}}{\text{a}}$$

$$\begin{aligned}
 & \left(0.014154825683162254 \cdot \text{ABT Cb}^3 \cdot \bar{a}^{-1.41434649220055} \cdot \frac{\text{ABT}^5}{\text{hb-x4-ABT}^2 \cdot \text{x2x4}} \cdot \text{x5}^2 \right) - \\
 & 0.35387064207905633 \cdot \text{ABT c4 Cb}^3 \cdot \bar{a}^{-1.41434649220055} \cdot \frac{\text{ABT}^5}{\text{hb-x4-ABT}^2 \cdot \text{x2x4}} \cdot \text{x5}^2 + \\
 & \text{x1}^{3-2} \cdot \left(0.00041414026809651473 \cdot \text{x2}^2 \right) - 0.000020619655732572913 \cdot \text{Cb}^4 \cdot \frac{\text{Cm}}{\bar{a}} \\
 & \bar{a}^{-1.41434649220055} \cdot \frac{\text{ABT}^5}{\text{hb-x4-ABT}^2 \cdot \text{x2x4}} \cdot \text{x5}^2 + 0.0005154913933143228 \cdot \text{c4 Cb}^4 \cdot \\
 & \frac{\text{Cm}}{\bar{a}} \cdot \bar{a}^{-1.41434649220055} \cdot \frac{\text{ABT}^5}{\text{hb-x4-ABT}^2 \cdot \text{x2x4}} \cdot \text{x5}^2 + 0.00041414026809651473 \cdot \\
 & \text{x4} \cdot \left(0.005388349608800421 \cdot \text{Cb}^4 \cdot \frac{\text{Cm}}{\bar{a}} \right) \cdot \bar{a}^{-1.41434649220055} \cdot \frac{\text{ABT}^5}{\text{hb-x4-ABT}^2 \cdot \text{x2x4}} \cdot \text{x5}^2 - \\
 & 0.13470874022001053 \cdot \text{c4 Cb}^4 \cdot \frac{\text{Cm}}{\bar{a}} \cdot \bar{a}^{-1.41434649220055} \cdot \frac{\text{ABT}^5}{\text{hb-x4-ABT}^2 \cdot \text{x2x4}} \cdot \text{x5}^2 + \\
 & 0.005263454088066636 \cdot \text{Cb}^5 \cdot \frac{\text{Cm}}{\bar{a}} \cdot \bar{a}^{-1.41434649220055} \cdot \frac{\text{ABT}^5}{\text{hb-x4-ABT}^2 \cdot \text{x2x4}} \cdot \text{x5}^2 - \\
 & 0.1315863522016659 \cdot \text{c4 Cb}^5 \cdot \frac{\text{Cm}}{\bar{a}} \cdot \bar{a}^{-1.41434649220055} \cdot \frac{\text{ABT}^5}{\text{hb-x4-ABT}^2 \cdot \text{x2x4}} \cdot \text{x5}^2 - \\
 & 0.0034042950508580147 \cdot \text{Cb}^4 \cdot \text{Cm}^{3+2} \cdot \bar{a}^{-1.41434649220055} \cdot \frac{\text{ABT}^5}{\text{hb-x4-ABT}^2 \cdot \text{x2x4}} \cdot \text{x5}^2 + \\
 & 0.08510737627145036 \cdot \text{c4 Cb}^4 \cdot \text{Cm}^{3+2} \cdot \bar{a}^{-1.41434649220055} \cdot \frac{\text{ABT}^5}{\text{hb-x4-ABT}^2 \cdot \text{x2x4}} \cdot \text{x5}^2 + \\
 & 0.004396322329829218 \cdot \text{Cb}^4 \cdot \frac{\text{Cm}}{\bar{a}} \cdot \text{Cw} \cdot \bar{a}^{-1.41434649220055} \cdot \frac{\text{ABT}^5}{\text{hb-x4-ABT}^2 \cdot \text{x2x4}} \cdot \text{x5}^2 - \\
 & 0.10990805824573044 \cdot \text{c4 Cb}^4 \cdot \frac{\text{Cm}}{\bar{a}} \cdot \text{Cw} \cdot \bar{a}^{-1.41434649220055} \cdot \frac{\text{ABT}^5}{\text{hb-x4-ABT}^2 \cdot \text{x2x4}} \cdot \text{x5}^2 + \\
 & 0.00041414026809651473 \cdot \text{x2} \cdot \left(0.002652935492935065 \cdot \text{Cb}^4 \cdot \frac{\text{Cm}}{\bar{a}} \right)
 \end{aligned}$$

$$\begin{aligned}
& \bar{a}^{-1.41434649220055} \left[\frac{ABT^{1.5}}{hb-x4-ABT^2x4} x5^2 \right] - \\
& 0.06632338732337661 \cdot c4 Cb^4 \cdot \left[\frac{ABT^{1.5}}{hb-x4-ABT^2x4} x5^2 \right] + \\
& 0.002631727044033318 \cdot Cb^5 \cdot \left[\frac{ABT^{1.5}}{hb-x4-ABT^2x4} x5^2 \right] - \\
& 0.06579317610083295 \cdot c4 Cb^5 \cdot \left[\frac{ABT^{1.5}}{hb-x4-ABT^2x4} x5^2 \right] - \\
& 0.0017021475254290074 \cdot Cb^4 \cdot C_m^{3 \cdot 2} \bar{a}^{-1.41434649220055} \left[\frac{ABT^{1.5}}{hb-x4-ABT^2x4} x5^2 \right] + \\
& 0.04255368813572518 \cdot c4 Cb^4 \cdot C_m^{3 \cdot 2} \bar{a}^{-1.41434649220055} \left[\frac{ABT^{1.5}}{hb-x4-ABT^2x4} x5^2 \right] + \\
& 0.002198161164914609 \cdot Cb^4 \cdot C_m C_w \bar{a}^{-1.41434649220055} \left[\frac{ABT^{1.5}}{hb-x4-ABT^2x4} x5^2 \right] - \\
& 0.05495402912286522 \cdot c4 Cb^4 \cdot C_m C_w \bar{a}^{-1.41434649220055} \left[\frac{ABT^{1.5}}{hb-x4-ABT^2x4} x5^2 \right] +
\end{aligned}$$

$$x1 \left[\frac{1}{k} \int_{-1}^1 C_m H90 \cdot \text{hal}^{1.37565} \cdot 7.4103484154325 \cdot *^6 AT c7^{3.78613} Cb \right]$$

$$\begin{aligned}
& \bar{a}^{-1.41434649220055} \cdot \left[\frac{ABT^{1.5}}{hb-x4-ABT^2x4} \right] + \\
& \left[\frac{1}{x1} \int_{-1}^1 5.081833302662383 \right] \cdot c16 - \frac{4.79323 \cdot x2}{x1} + \frac{0.0140407 \cdot x1}{x4} - \\
& \frac{1.75254 \cdot Cb \cdot x2 \cdot x4}{HCb \cdot x1 \cdot x2 \cdot x4} \cdot \left[\frac{w}{z} + 0 \cdot \bar{a} \right] + \\
& \text{CosB} \cdot \frac{-13.34248601399447 + 53.59231882287779 \cdot C_p}{x1} \cdot \left[\frac{v}{x2} \right] + \frac{1.07961 \cdot v}{x2}
\end{aligned}$$

$$x2 \left[\frac{1}{k} \int_{-1}^1 H90 \cdot \text{hal}^{1.37565} \cdot 9.262935519290624 \cdot *^6 c7^{3.78613} Cb \bar{a}^{-1.41434649220055} \right]$$

$$\begin{aligned}
& \bar{a}^{-1.41434649220055} \cdot \left[\frac{ABT^{1.5}}{hb-x4-ABT^2x4} \right] + \left[\frac{1}{x1} \int_{-1}^1 5.081833302662383 \right] \cdot c16 - \\
& \frac{4.79323 \cdot x2}{x1} + \frac{0.0140407 \cdot x1}{x4} - \frac{1.75254 \cdot Cb \cdot x2 \cdot x4}{HCb \cdot x1 \cdot x2 \cdot x4} \cdot \left[\frac{w}{z} + 0 \cdot \bar{a} \right] + \\
& \text{CosB} \cdot \frac{-13.34248601399447 + 53.59231882287779 \cdot C_p}{x1} \cdot \left[\frac{v}{x2} \right] + \frac{1.07961 \cdot v}{x2}
\end{aligned}$$

$$\begin{aligned}
& x^4 \int \frac{x^{1.07961}}{x^2} + 0.00041414026809651473 \\
& -0.12411661903448232 \cdot C_m^{(5)} x^{5^2} - 0.123124389491148 \cdot C_b \cdot C_m^{(5)} x^{5^2} + \\
& 0.07963435089800353 \cdot C_m^{(3+2)} x^{5^2} - 0.10284016803599616 \cdot C_m^{(5)} C_w x^{5^2} + \\
& \frac{0.36326815327165557 \cdot C_m^{(5)} x^{5^2}}{H100 \cdot + x1L^{0.16}} + \frac{0.36036406680336 \cdot C_b \cdot C_m^{(5)} x^{5^2}}{H100 \cdot + x1L^{0.16}} - \\
& \frac{0.2330761489697664 \cdot C_m^{(3+2)} x^{5^2}}{H100 \cdot + x1L^{0.16}} + \frac{0.30099561376389117 \cdot C_m^{(5)} C_w x^{5^2}}{H100 \cdot + x1L^{0.16}} + \\
& \frac{4.222992281782996 \cdot C_m^{(5)} x^{5^2}}{H3.6363748627922092 + 0.43429448190325176 \cdot \text{Log} \otimes 1 x5DL^2} + \\
& \frac{4.189232276589061 \cdot C_b \cdot C_m^{(5)} x^{5^2}}{H3.6363748627922092 + 0.43429448190325176 \cdot \text{Log} \otimes 1 x5DL^2} - \\
& \frac{2.7095102317735344 \cdot C_m^{(3+2)} x^{5^2}}{H3.6363748627922092 + 0.43429448190325176 \cdot \text{Log} \otimes 1 x5DL^2} + \\
& \frac{3.4990740100052347 \cdot C_m^{(5)} C_w x^{5^2}}{H3.6363748627922092 + 0.43429448190325176 \cdot \text{Log} \otimes 1 x5DL^2} + \\
& \int \frac{2.211930703567279 \cdot C_m^{(5)}}{1 \cdot - Cp + \frac{0.121563}{-1. +4. Cp}} \\
& \int \frac{x^{1.06806}}{x1} \int \frac{x^{1.2}}{Cb x2 x4} \int \frac{x^{0.36486}}{x1} \int \frac{x^{0.46106}}{x1} x^{5^2} \cdot H1 \cdot - Cpl^{0.60247} \\
& H3.6363748627922092 + 0.43429448190325176 \cdot \text{Log} \otimes 1 x5DL^2 \cdot L + \\
& \int \frac{2.194247793663989 \cdot C_b \cdot C_m^{(5)}}{1 \cdot - Cp + \frac{0.121563}{-1. +4. Cp}} \\
& \int \frac{x^{1.06806}}{x1} \int \frac{x^{1.2}}{Cb x2 x4} \int \frac{x^{0.36486}}{x1} \int \frac{x^{0.46106}}{x1} x^{5^2} \cdot H1 \cdot - Cpl^{0.60247} \\
& H3.6363748627922092 + 0.43429448190325176 \cdot \text{Log} \otimes 1 x5DL^2 \cdot L - \\
& \int \frac{1.4191948441731832 \cdot C_m^{(3+2)}}{1 \cdot - Cp + \frac{0.121563}{-1. +4. Cp}} \\
& \int \frac{x^{1.06806}}{x1} \int \frac{x^{1.2}}{Cb x2 x4} \int \frac{x^{0.36486}}{x1} \int \frac{x^{0.46106}}{x1} x^{5^2} \cdot H1 \cdot - Cpl^{0.60247} \\
& H3.6363748627922092 + 0.43429448190325176 \cdot \text{Log} \otimes 1 x5DL^2 \cdot L + \\
& \int \frac{0.024331237739240067 \cdot C_m^{(5)} C_{stern}}{1 \cdot - Cp + \frac{0.121563}{-1. +4. Cp}}
\end{aligned}$$

$$\begin{aligned}
& \int \frac{x^2}{x^4} \frac{1.06806}{k} \int \frac{x^2}{k} \frac{0.36486}{Cb \ x^2 \ x^4} \int \frac{x^4}{x^4} \frac{0.46106}{x^5} \int \frac{HH1.}{-Cpl} \frac{0.60247}{\{ \\
& H3.6363748627922092 \cdot + 0.43429448190325176 \text{ Log} @ x1 \ x5DL^{2.} \ L + \\
& \int \frac{0.024136725730303878}{k} \int \frac{Cm}{Cstern} \int \frac{0.121563}{k} \int \frac{1.}{-Cp +} \int \frac{-1.}{-1. +4. Cp} \int \frac{0.121563}{\{
\end{aligned}$$

$$\begin{aligned}
& \int \frac{x^2}{x^4} \frac{1.06806}{k} \int \frac{x^2}{k} \frac{0.36486}{Cb \ x^2 \ x^4} \int \frac{x^4}{x^4} \frac{0.46106}{x^5} \int \frac{HH1.}{-Cpl} \frac{0.60247}{\{ \\
& H3.6363748627922092 \cdot + 0.43429448190325176 \text{ Log} @ x1 \ x5DL^{2.} \ L - \\
& \int \frac{0.015611143285905016}{k} \int \frac{Cm^{3 \cdot 2}}{Cstern} \int \frac{0.121563}{k} \int \frac{1.}{-Cp +} \int \frac{-1.}{-1. +4. Cp} \int \frac{0.121563}{\{
\end{aligned}$$

$$\begin{aligned}
& \int \frac{x^2}{x^4} \frac{1.06806}{k} \int \frac{x^2}{k} \frac{0.36486}{Cb \ x^2 \ x^4} \int \frac{x^4}{x^4} \frac{0.46106}{x^5} \int \frac{HH1.}{-Cpl} \frac{0.60247}{\{ \\
& H3.6363748627922092 \cdot + 0.43429448190325176 \text{ Log} @ x1 \ x5DL^{2.} \ L + \\
& \int \frac{1.8327547673179891}{k} \int \frac{Cm}{Cw} \int \frac{0.121563}{k} \int \frac{1.}{-Cp +} \int \frac{-1.}{-1. +4. Cp} \int \frac{0.121563}{\{
\end{aligned}$$

$$\begin{aligned}
& \int \frac{x^2}{x^4} \frac{1.06806}{k} \int \frac{x^2}{k} \frac{0.36486}{Cb \ x^2 \ x^4} \int \frac{x^4}{x^4} \frac{0.46106}{x^5} \int \frac{HH1.}{-Cpl} \frac{0.60247}{\{ \\
& H3.6363748627922092 \cdot + 0.43429448190325176 \text{ Log} @ x1 \ x5DL^{2.} \ L + \\
& \int \frac{0.02016030244049788}{k} \int \frac{Cm}{Cstern \ Cw} \int \frac{0.121563}{k} \int \frac{1.}{-Cp +} \int \frac{-1.}{-1. +4. Cp} \int \frac{0.121563}{\{
\end{aligned}$$

$$\begin{aligned}
& \int \frac{x^2}{x^4} \frac{1.06806}{k} \int \frac{x^2}{k} \frac{0.36486}{Cb \ x^2 \ x^4} \int \frac{x^4}{x^4} \frac{0.46106}{x^5} \int \frac{HH1.}{-Cpl} \frac{0.60247}{\{ \\
& H3.6363748627922092 \cdot + 0.43429448190325176 \text{ Log} @ x1 \ x5DL^{2.} \ L + \\
& \int \frac{0.00041414026809651473}{x^4} \int \frac{0.0009646830697532433}{k} \int \frac{Cm}{x^5} \frac{0.121563}{-}
\end{aligned}$$

$$\begin{aligned}
& \int \frac{0.002823462643180224}{H100.} \int \frac{Cm}{x^5} \frac{0.121563}{-} \\
& \int \frac{0.032822753226970106}{H3.6363748627922092 \cdot + 0.43429448190325176 \text{ Log} @ x1 \ x5DL^{2.} \ L -} \int \frac{Cm}{x^5} \frac{0.121563}{-}
\end{aligned}$$

$$\begin{aligned}
& \int \frac{0.017191993447758305}{k} \int \frac{Cm}{Cstern} \int \frac{0.121563}{k} \int \frac{1.}{-Cp +} \int \frac{-1.}{-1. +4. Cp} \int \frac{0.121563}{\{
\end{aligned}$$

$$\int \frac{x^2}{x^4} \frac{1.06806}{k} \int \frac{x^2}{k} \frac{0.36486}{Cb \ x^2 \ x^4} \int \frac{x^4}{x^4} \frac{0.46106}{x^5} \int \frac{HH1.}{-Cpl} \frac{0.60247}{\{$$

$$\begin{aligned}
& \text{HH1.}^{\cdot} - \text{Cpl}^{0.60247} \text{H3.6363748627922092}^{\cdot} + 0.43429448190325176^{\cdot} \text{Log@x1 x5DL}^{2.} \text{L} - \\
& \left\{ \begin{array}{l} 0.00018911192792534135^{\cdot} \cdot \text{Cm}^{\cdot} \text{Cstern} \\ 1. - \text{Cp} + \end{array} \right\}^{0.121563} \\
& \left\{ \begin{array}{l} \text{J} \frac{x^2}{x1} \\ \text{J} \frac{x1^2}{\text{Cb } x2 \text{ } x4} \\ \text{J} \frac{x4}{x1} \end{array} \right\}^{1.06806} \left\{ \begin{array}{l} \text{J} \frac{x1^2}{\text{Cb } x2 \text{ } x4} \\ \text{J} \frac{x4}{x1} \end{array} \right\}^{0.36486} \left\{ \begin{array}{l} \text{J} \frac{x4}{x1} \\ x5^2. \end{array} \right\}^{0.46106} \text{HH1.}^{\cdot} - \text{Cpl}^{0.60247} \\
& \text{H3.6363748627922092}^{\cdot} + 0.43429448190325176^{\cdot} \text{Log@x1 x5DL}^{2.} \text{L} + \\
& 0.00041414026809651473^{\cdot} x4^{\cdot} - 0.2520919703479776^{\cdot} \cdot \text{Cm}^{\cdot} x5^2. - \\
& 0.246248778982296^{\cdot} \text{Cb} \cdot \text{Cm}^{\cdot} x5^2. + 0.15926870179600705^{\cdot} \text{Cm}^{3.2} x5^2. - \\
& 0.20568033607199232^{\cdot} \cdot \text{Cm}^{\cdot} \text{Cw } x5^2. + \\
& \frac{0.737830157116032^{\cdot} \cdot \text{Cm}^{\cdot} x5^2.}{\text{H100.}^{\cdot} + x1\text{L}^{0.16}} + \frac{0.72072813360672^{\cdot} \text{Cb} \cdot \text{Cm}^{\cdot} x5^2.}{\text{H100.}^{\cdot} + x1\text{L}^{0.16}} - \\
& \frac{0.4661522979395328^{\cdot} \text{Cm}^{3.2} x5^2.}{\text{H100.}^{\cdot} + x1\text{L}^{0.16}} + \\
& \frac{0.6019912275277823^{\cdot} \cdot \text{Cm}^{\cdot} \text{Cw } x5^2.}{\text{H100.}^{\cdot} + x1\text{L}^{0.16}} + \\
& \frac{8.577275576473872^{\cdot} \cdot \text{Cm}^{\cdot} x5^2.}{\text{H3.6363748627922092}^{\cdot} + 0.43429448190325176^{\cdot} \text{Log@x1 x5DL}^{2.}} + \\
& \frac{8.378464553178121^{\cdot} \text{Cb} \cdot \text{Cm}^{\cdot} x5^2.}{\text{H3.6363748627922092}^{\cdot} + 0.43429448190325176^{\cdot} \text{Log@x1 x5DL}^{2.}} - \\
& \frac{5.419020463547069^{\cdot} \text{Cm}^{3.2} x5^2.}{\text{H3.6363748627922092}^{\cdot} + 0.43429448190325176^{\cdot} \text{Log@x1 x5DL}^{2.}} + \\
& \frac{6.998148020010469^{\cdot} \cdot \text{Cm}^{\cdot} \text{Cw } x5^2.}{\text{H3.6363748627922092}^{\cdot} + 0.43429448190325176^{\cdot} \text{Log@x1 x5DL}^{2.}} + \\
& \left\{ \begin{array}{l} 4.492629380925591^{\cdot} \cdot \text{Cm}^{\cdot} \\ 1. - \text{Cp} + \end{array} \right\}^{0.121563} \\
& \left\{ \begin{array}{l} \text{J} \frac{x^2}{x1} \\ \text{J} \frac{x1^2}{\text{Cb } x2 \text{ } x4} \\ \text{J} \frac{x4}{x1} \end{array} \right\}^{1.06806} \left\{ \begin{array}{l} \text{J} \frac{x1^2}{\text{Cb } x2 \text{ } x4} \\ \text{J} \frac{x4}{x1} \end{array} \right\}^{0.36486} \left\{ \begin{array}{l} \text{J} \frac{x4}{x1} \\ x5^2. \end{array} \right\}^{0.46106} \text{HH1.}^{\cdot} - \text{Cpl}^{0.60247} \text{H3.6363748627922092}^{\cdot} + 0.43429448190325176^{\cdot} \text{Log@x1 x5DL}^{2.} \text{L} + \\
& \left\{ \begin{array}{l} 4.388495587327978^{\cdot} \text{Cb} \cdot \text{Cm}^{\cdot} \\ 1. - \text{Cp} + \end{array} \right\}^{0.121563} \\
& \left\{ \begin{array}{l} \text{J} \frac{x^2}{x1} \\ \text{J} \frac{x1^2}{\text{Cb } x2 \text{ } x4} \\ \text{J} \frac{x4}{x1} \end{array} \right\}^{1.06806} \left\{ \begin{array}{l} \text{J} \frac{x1^2}{\text{Cb } x2 \text{ } x4} \\ \text{J} \frac{x4}{x1} \end{array} \right\}^{0.36486} \left\{ \begin{array}{l} \text{J} \frac{x4}{x1} \\ x5^2. \end{array} \right\}^{0.46106} \text{HH1.}^{\cdot} - \text{Cpl}^{0.60247} \text{H3.6363748627922092}^{\cdot} + 0.43429448190325176^{\cdot} \text{Log@x1 x5DL}^{2.} \text{L} -
\end{aligned}$$

$$2.8383896883463664 \cdot \text{Cm}^{3 \cdot 2} \cdot \left(1 - \text{Cp} + \frac{\text{Cp}^2}{-1. + 4. \text{Cp}} \right)^{0.121563}$$

$$\frac{\int \frac{x^2}{x^1} dx}{1.06806} \cdot \frac{\int \frac{x^{1.2}}{\text{Cb} x^2 x^4} dx}{0.36486} \cdot \frac{\int \frac{x^4}{x^1} dx}{0.46106} \cdot x^{5.2}$$

$$\text{H}1 - \text{Cpl}^{0.60247} \text{H}3.6363748627922092 + 0.43429448190325176 \text{Log}x1 x50l^{2.} l +$$

$$0.0494189231901815 \cdot \text{Cm} \cdot \text{Cstern} \cdot \left(1 - \text{Cp} + \frac{\text{Cp}^2}{-1. + 4. \text{Cp}} \right)^{0.121563}$$

$$\frac{\int \frac{x^2}{x^1} dx}{1.06806} \cdot \frac{\int \frac{x^{1.2}}{\text{Cb} x^2 x^4} dx}{0.36486} \cdot \frac{\int \frac{x^4}{x^1} dx}{0.46106} \cdot x^{5.2}$$

$$\text{H}1 - \text{Cpl}^{0.60247} \text{H}3.6363748627922092 + 0.43429448190325176 \text{Log}x1 x50l^{2.} l +$$

$$0.048273451460607755 \cdot \text{Cb} \cdot \text{Cm} \cdot \text{Cstern} \cdot \left(1 - \text{Cp} + \frac{\text{Cp}^2}{-1. + 4. \text{Cp}} \right)^{0.121563}$$

$$\frac{\int \frac{x^2}{x^1} dx}{1.06806} \cdot \frac{\int \frac{x^{1.2}}{\text{Cb} x^2 x^4} dx}{0.36486} \cdot \frac{\int \frac{x^4}{x^1} dx}{0.46106} \cdot x^{5.2}$$

$$\text{H}1 - \text{Cpl}^{0.60247} \text{H}3.6363748627922092 + 0.43429448190325176 \text{Log}x1 x50l^{2.} l -$$

$$0.031222286571810032 \cdot \text{Cm}^{3 \cdot 2} \cdot \text{Cstern} \cdot \left(1 - \text{Cp} + \frac{\text{Cp}^2}{-1. + 4. \text{Cp}} \right)^{0.121563}$$

$$\frac{\int \frac{x^2}{x^1} dx}{1.06806} \cdot \frac{\int \frac{x^{1.2}}{\text{Cb} x^2 x^4} dx}{0.36486} \cdot \frac{\int \frac{x^4}{x^1} dx}{0.46106} \cdot x^{5.2}$$

$$\text{H}1 - \text{Cpl}^{0.60247} \text{H}3.6363748627922092 + 0.43429448190325176 \text{Log}x1 x50l^{2.} l +$$

$$3.6655095346359783 \cdot \text{Cm} \cdot \text{Cw} \cdot \left(1 - \text{Cp} + \frac{\text{Cp}^2}{-1. + 4. \text{Cp}} \right)^{0.121563}$$

$$\frac{\int \frac{x^2}{x^1} dx}{1.06806} \cdot \frac{\int \frac{x^{1.2}}{\text{Cb} x^2 x^4} dx}{0.36486} \cdot \frac{\int \frac{x^4}{x^1} dx}{0.46106} \cdot x^{5.2}$$

$$\text{H}1 - \text{Cpl}^{0.60247} \text{H}3.6363748627922092 + 0.43429448190325176 \text{Log}x1 x50l^{2.} l +$$

$$0.04032060488099576 \cdot \text{Cm} \cdot \text{Cstern} \cdot \text{Cw} \cdot \left(1 - \text{Cp} + \frac{\text{Cp}^2}{-1. + 4. \text{Cp}} \right)^{0.121563}$$

$$\frac{\int \frac{x^2}{x^1} dx}{1.06806} \cdot \frac{\int \frac{x^{1.2}}{\text{Cb} x^2 x^4} dx}{0.36486} \cdot \frac{\int \frac{x^4}{x^1} dx}{0.46106} \cdot x^{5.2}$$

$$\text{H}1 - \text{Cpl}^{0.60247} \text{H}3.6363748627922092 + 0.43429448190325176 \text{Log}x1 x50l^{2.} l +$$

$$0.00041414026809651473 \cdot 135.730345312 \cdot \text{AT} c6 x5^{2.} -$$

$$\frac{0.662228354777248 \cdot \text{ABT} x^{5^2}}{\text{Cb}} +$$

$$\frac{1.9382293310553598 \cdot \text{ABT} x^{5^2}}{\text{Cb} \sqrt{100} + x^{11^{0.16}}} +$$

$$\frac{569.2916975592 \cdot \text{ABT}^{1.5} \bar{a}}{k} \left\{ \frac{-0.566236320613344}{k-1.5} \frac{1}{hb+x^9} \right\}$$

$$1x5' |' | -2.45175 \cdot \text{ABT} - 9.807 \text{ hb} + 9.807 x4 + 0.03969110399999999 x^{5^2} \text{MM}^{\wedge}$$

$$3. \sqrt{\text{ " } | 3.779184373405185 \text{ " } +}$$

$$1. \text{ } | x5' |' | -2.45175 \cdot \text{ABT} - 9.807 \text{ hb} + 9.807 x4 + 0.03969110399999999 x^{5^2} \text{MM}^{\wedge}$$

$$2. \text{ " } +$$

$$\frac{22.531915973518558 \cdot \text{ABT} x^{5^2}}{\text{Cb} \sqrt{3.6363748627922092} + 0.43429448190325176 \text{ Log} @ x1 x5 \text{DL}^{\wedge}}$$

$$\frac{11.80182994106281 \cdot \text{ABT}}{k} \left\{ \frac{1. \text{ " } - \text{Cp} + \frac{0.121563}{-1. + 4. \text{Cp}} \right\}$$

$$\frac{\int \frac{x^2}{x1} \cdot 1.06806}{k} \left\{ \frac{\int \frac{x1^{2.}}{\text{Cb} x2 x4} \cdot 0.36486}{k} \right\} \frac{\int \frac{x4}{x1} \cdot 0.46106}{k} \left\{ \frac{x5^2}{k} \right\} \text{ " }$$

$$\sqrt{\text{Cb} \sqrt{1.} - \text{Cp} \sqrt{0.60247} \sqrt{3.6363748627922092} + 0.43429448190325176 \text{ Log} @ x1 x5 \text{DL}^{\wedge} \text{L} +}$$

$$\frac{0.1298201293516909 \cdot \text{ABT} \text{Cstern}}{k} \left\{ \frac{1. \text{ " } - \text{Cp} + \frac{0.121563}{-1. + 4. \text{Cp}} \right\}$$

$$\frac{\int \frac{x^2}{x1} \cdot 1.06806}{k} \left\{ \frac{\int \frac{x1^{2.}}{\text{Cb} x2 x4} \cdot 0.36486}{k} \right\} \frac{\int \frac{x4}{x1} \cdot 0.46106}{k} \left\{ \frac{x5^2}{k} \right\} \text{ " }$$

$$\sqrt{\text{Cb} \sqrt{1.} - \text{Cp} \sqrt{0.60247} \sqrt{3.6363748627922092} + 0.43429448190325176 \text{ Log} @ x1 x5 \text{DL}^{\wedge} \text{L} \sqrt{\text{ " } +}$$

Appendix K

Mathematical Form of the Center of Gravity of the Fuel Weight

KGf =

$$7.463089026259201 \cdot 10^{-7} \cdot \frac{1}{x_1}$$

$$\begin{aligned} & \left\{ 0.014154825683162254 \cdot \text{ABT Cb}^3 \cdot \bar{a}^{-1.41434649220055} \cdot \frac{1}{x_1^5} \cdot x_5^2 \right. \\ & 0.35387064207905633 \cdot \text{ABT c4 Cb}^3 \cdot \bar{a}^{-1.41434649220055} \cdot \frac{1}{x_1^5} \cdot x_5^2 \left. \right\} + \\ & x_1^{3 \cdot 2} \left\{ 7.463089026259201 \cdot 10^{-7} \cdot x_2^2 \cdot -0.000020619655732572913 \cdot \text{Cb}^4 \cdot \frac{1}{x_1^5} \right. \\ & \bar{a}^{-1.41434649220055} \cdot \frac{1}{x_1^5} \cdot x_5^2 + 0.0005154913933143228 \cdot \text{c4 Cb}^4 \cdot \\ & \left. \frac{1}{x_1^5} \cdot \bar{a}^{-1.41434649220055} \cdot \frac{1}{x_1^5} \cdot x_5^2 \right\} + 7.463089026259201 \cdot 10^{-7} \\ & x_4 \left\{ 0.005388349608800421 \cdot \text{Cb}^4 \cdot \frac{1}{x_1^5} \cdot \bar{a}^{-1.41434649220055} \cdot \frac{1}{x_1^5} \cdot x_5^2 \right. \\ & 0.13470874022001053 \cdot \text{c4 Cb}^4 \cdot \frac{1}{x_1^5} \cdot \bar{a}^{-1.41434649220055} \cdot \frac{1}{x_1^5} \cdot x_5^2 + \\ & 0.005263454088066636 \cdot \text{Cb}^5 \cdot \frac{1}{x_1^5} \cdot \bar{a}^{-1.41434649220055} \cdot \frac{1}{x_1^5} \cdot x_5^2 - \\ & 0.1315863522016659 \cdot \text{c4 Cb}^5 \cdot \frac{1}{x_1^5} \cdot \bar{a}^{-1.41434649220055} \cdot \frac{1}{x_1^5} \cdot x_5^2 - \\ & 0.0034042950508580147 \cdot \text{Cb}^4 \cdot \text{Cm}^{3 \cdot 2} \cdot \bar{a}^{-1.41434649220055} \cdot \frac{1}{x_1^5} \cdot x_5^2 + \\ & 0.08510737627145036 \cdot \text{c4 Cb}^4 \cdot \text{Cm}^{3 \cdot 2} \cdot \bar{a}^{-1.41434649220055} \cdot \frac{1}{x_1^5} \cdot x_5^2 + \\ & 0.004396322329829218 \cdot \text{Cb}^4 \cdot \frac{1}{x_1^5} \cdot \text{Cm Cw} \cdot \bar{a}^{-1.41434649220055} \cdot \frac{1}{x_1^5} \cdot x_5^2 - \\ & 0.10990805824573044 \cdot \text{c4 Cb}^4 \cdot \frac{1}{x_1^5} \cdot \text{Cm Cw} \cdot \bar{a}^{-1.41434649220055} \cdot \frac{1}{x_1^5} \cdot x_5^2 \left. \right\} + \\ & 7.463089026259201 \cdot 10^{-7} \cdot x_2 \cdot \left\{ 0.002652935492935065 \cdot \text{Cb}^4 \cdot \frac{1}{x_1^5} \right\} \end{aligned}$$

$$\begin{aligned}
& \bar{a}^{-1.41434649220055} \left[\frac{ABT^{1.5}}{hb-x4-ABT^2x4} x5^2 \right] - \\
& 0.06632338732337661 \cdot c4 Cb^4 \cdot \left[\frac{ABT^{1.5}}{hb-x4-ABT^2x4} x5^2 \right] + \\
& 0.002631727044033318 \cdot Cb^5 \cdot \left[\frac{ABT^{1.5}}{hb-x4-ABT^2x4} x5^2 \right] - \\
& 0.06579317610083295 \cdot c4 Cb^5 \cdot \left[\frac{ABT^{1.5}}{hb-x4-ABT^2x4} x5^2 \right] - \\
& 0.0017021475254290074 \cdot Cb^4 \cdot Cm^{3 \cdot 2} \bar{a}^{-1.41434649220055} \left[\frac{ABT^{1.5}}{hb-x4-ABT^2x4} x5^2 \right] + \\
& 0.04255368813572518 \cdot c4 Cb^4 \cdot Cm^{3 \cdot 2} \bar{a}^{-1.41434649220055} \left[\frac{ABT^{1.5}}{hb-x4-ABT^2x4} x5^2 \right] + \\
& 0.002198161164914609 \cdot Cb^4 \cdot Cm Cw \bar{a}^{-1.41434649220055} \left[\frac{ABT^{1.5}}{hb-x4-ABT^2x4} x5^2 \right] - \\
& 0.05495402912286522 \cdot c4 Cb^4 \cdot Cm Cw \bar{a}^{-1.41434649220055} \left[\frac{ABT^{1.5}}{hb-x4-ABT^2x4} x5^2 \right] +
\end{aligned}$$

$$x1 \left[\frac{1}{k} \right] - Cm H90 \cdot \left[\frac{1}{hal^{1.37565}} \right] 13353.951354250588 \cdot AT c7^{3.78613} Cb$$

$$\bar{a}^{-1.41434649220055} \cdot \left[\frac{ABT^{1.5}}{hb-x4-ABT^2x4} \right] +$$

$$\left[\frac{1}{x1} \right] \left[\frac{1}{k} \right] 5.081833302662383 \cdot \left[\frac{1}{k} \right] - c16 - \frac{4.79323 \cdot x2}{x1} + \frac{0.0140407 \cdot x1}{x4} -$$

$$\frac{1.75254 \cdot Cb x2 x4}{HCb x1 x2 x4} \left[\frac{1}{0.6666666666666667} \right] \left[\frac{1}{k} \right] \left[\frac{1}{x1} \right] + 0 \cdot \bar{a}^{-1.41434649220055} \left[\frac{1}{k} \right] \left[\frac{1}{x1} \right]$$

$$CosB \frac{-13.34248601399447 + 53.59231882287779 \cdot Cp}{\left[\frac{1}{x1} \right]} + \frac{1.07961 \cdot \left[\frac{1}{k} \right]}{\left[\frac{1}{x2} \right]} +$$

$$x2 \left[\frac{1}{k} \right] - H90 \cdot \left[\frac{1}{hal^{1.37565}} \right] 16692.439192813235 \cdot c7^{3.78613} Cb \bar{a}^{-1.41434649220055}$$

$$& \left[\frac{ABT^{1.5}}{hb-x4-ABT^2x4} \right] + \left[\frac{1}{x1} \right] \left[\frac{1}{k} \right] 5.081833302662383 \cdot \left[\frac{1}{k} \right] - c16 -$$

$$\frac{4.79323 \cdot x2}{x1} + \frac{0.0140407 \cdot x1}{x4} - \frac{1.75254 \cdot Cb x2 x4}{HCb x1 x2 x4} \left[\frac{1}{0.6666666666666667} \right] \left[\frac{1}{k} \right] \left[\frac{1}{x1} \right] +$$

$$0 \cdot \bar{a}^{-1.41434649220055} \left[\frac{1}{k} \right] \left[\frac{1}{x1} \right] CosB \frac{-13.34248601399447 + 53.59231882287779 \cdot Cp}{\left[\frac{1}{x1} \right]} +$$

$$\begin{aligned}
& x^4 \int \frac{x^{1.07961}}{x^2} + 7.463089026259201 \cdot x^{-7} \\
& -0.12411661903448232 \cdot C_m^{(5)} x^{5^2} - 0.123124389491148 \cdot C_b \cdot C_m^{(5)} x^{5^2} + \\
& 0.07963435089800353 \cdot C_m^{3 \cdot 2} x^{5^2} - 0.10284016803599616 \cdot C_m^{(5)} C_w x^{5^2} + \\
& \frac{0.36326815327165557 \cdot C_m^{(5)} x^{5^2}}{H100 \cdot + x1L^{0.16}} + \frac{0.36036406680336 \cdot C_b \cdot C_m^{(5)} x^{5^2}}{H100 \cdot + x1L^{0.16}} - \\
& \frac{0.2330761489697664 \cdot C_m^{3 \cdot 2} x^{5^2}}{H100 \cdot + x1L^{0.16}} + \frac{0.30099561376389117 \cdot C_m^{(5)} C_w x^{5^2}}{H100 \cdot + x1L^{0.16}} + \\
& \frac{4.222992281782996 \cdot C_m^{(5)} x^{5^2}}{H3.6363748627922092 \cdot + 0.43429448190325176 \cdot \text{Log} \otimes 1 x5DL^2} + \\
& \frac{4.189232276589061 \cdot C_b \cdot C_m^{(5)} x^{5^2}}{H3.6363748627922092 \cdot + 0.43429448190325176 \cdot \text{Log} \otimes 1 x5DL^2} - \\
& \frac{2.7095102317735344 \cdot C_m^{3 \cdot 2} x^{5^2}}{H3.6363748627922092 \cdot + 0.43429448190325176 \cdot \text{Log} \otimes 1 x5DL^2} + \\
& \frac{3.4990740100052347 \cdot C_m^{(5)} C_w x^{5^2}}{H3.6363748627922092 \cdot + 0.43429448190325176 \cdot \text{Log} \otimes 1 x5DL^2} + \\
& \int \frac{2.211930703567279 \cdot C_m^{(5)}}{1 \cdot - Cp + \frac{0.121563}{-1 \cdot +4 \cdot Cp}} \\
& \int \frac{x^2}{x1} \int \frac{x^{1.06806}}{k} \int \frac{x^{1.2}}{k} \int \frac{x^{0.36486}}{k} \int \frac{x^4}{x1} \int \frac{x^{0.46106}}{k} x^{5^2} \cdot H1 \cdot - Cpl^{0.60247} \\
& H3.6363748627922092 \cdot + 0.43429448190325176 \cdot \text{Log} \otimes 1 x5DL^2 \cdot L + \\
& \int \frac{2.194247793663989 \cdot C_b \cdot C_m^{(5)}}{1 \cdot - Cp + \frac{0.121563}{-1 \cdot +4 \cdot Cp}} \\
& \int \frac{x^2}{x1} \int \frac{x^{1.06806}}{k} \int \frac{x^{1.2}}{k} \int \frac{x^{0.36486}}{k} \int \frac{x^4}{x1} \int \frac{x^{0.46106}}{k} x^{5^2} \cdot H1 \cdot - Cpl^{0.60247} \\
& H3.6363748627922092 \cdot + 0.43429448190325176 \cdot \text{Log} \otimes 1 x5DL^2 \cdot L - \\
& \int \frac{1.4191948441731832 \cdot C_m^{3 \cdot 2}}{1 \cdot - Cp + \frac{0.121563}{-1 \cdot +4 \cdot Cp}} \\
& \int \frac{x^2}{x1} \int \frac{x^{1.06806}}{k} \int \frac{x^{1.2}}{k} \int \frac{x^{0.36486}}{k} \int \frac{x^4}{x1} \int \frac{x^{0.46106}}{k} x^{5^2} \cdot H1 \cdot - Cpl^{0.60247} \\
& H3.6363748627922092 \cdot + 0.43429448190325176 \cdot \text{Log} \otimes 1 x5DL^2 \cdot L + \\
& \int \frac{0.024331237739240067 \cdot C_m^{(5)} Cstern}{1 \cdot - Cp + \frac{0.121563}{-1 \cdot +4 \cdot Cp}}
\end{aligned}$$

$$\begin{aligned}
& \int_0^1 \frac{x^2}{x^2} \cdot 1.06806 \int_0^1 \frac{x^2}{k} \cdot x^{1.2} \cdot 0.36486 \int_0^1 \frac{x^4}{x^2} \cdot 0.46106 x^5 \cdot \int_0^1 \frac{1}{x} \cdot \text{HH1.} - \text{Cpl}^{0.60247} \\
& \text{H3.6363748627922092} + 0.43429448190325176 \text{ Log} \times 1 x 5 \text{DL}^{2.} \text{L} + \\
& \int_0^1 \frac{1}{k} \cdot 0.024136725730303878 \cdot \text{Cb} \cdot \text{Cm} \cdot \text{Cstern} \int_0^1 \frac{1}{k} \cdot \text{Cp} + \int_0^1 \frac{1}{-1. + 4. \text{Cp}} \cdot 0.121563
\end{aligned}$$

$$\begin{aligned}
& \int_0^1 \frac{x^2}{x^2} \cdot 1.06806 \int_0^1 \frac{x^2}{k} \cdot x^{1.2} \cdot 0.36486 \int_0^1 \frac{x^4}{x^2} \cdot 0.46106 x^5 \cdot \int_0^1 \frac{1}{x} \cdot \text{HH1.} - \text{Cpl}^{0.60247} \\
& \text{H3.6363748627922092} + 0.43429448190325176 \text{ Log} \times 1 x 5 \text{DL}^{2.} \text{L} - \\
& \int_0^1 \frac{1}{k} \cdot 0.015611143285905016 \cdot \text{Cm}^{3 \cdot 2} \cdot \text{Cstern} \int_0^1 \frac{1}{k} \cdot \text{Cp} + \int_0^1 \frac{1}{-1. + 4. \text{Cp}} \cdot 0.121563
\end{aligned}$$

$$\begin{aligned}
& \int_0^1 \frac{x^2}{x^2} \cdot 1.06806 \int_0^1 \frac{x^2}{k} \cdot x^{1.2} \cdot 0.36486 \int_0^1 \frac{x^4}{x^2} \cdot 0.46106 x^5 \cdot \int_0^1 \frac{1}{x} \cdot \text{HH1.} - \text{Cpl}^{0.60247} \\
& \text{H3.6363748627922092} + 0.43429448190325176 \text{ Log} \times 1 x 5 \text{DL}^{2.} \text{L} + \\
& \int_0^1 \frac{1}{k} \cdot 1.8327547673179891 \cdot \text{Cm} \cdot \text{Cw} \int_0^1 \frac{1}{k} \cdot \text{Cp} + \int_0^1 \frac{1}{-1. + 4. \text{Cp}} \cdot 0.121563
\end{aligned}$$

$$\begin{aligned}
& \int_0^1 \frac{x^2}{x^2} \cdot 1.06806 \int_0^1 \frac{x^2}{k} \cdot x^{1.2} \cdot 0.36486 \int_0^1 \frac{x^4}{x^2} \cdot 0.46106 x^5 \cdot \int_0^1 \frac{1}{x} \cdot \text{HH1.} - \text{Cpl}^{0.60247} \\
& \text{H3.6363748627922092} + 0.43429448190325176 \text{ Log} \times 1 x 5 \text{DL}^{2.} \text{L} + \\
& \int_0^1 \frac{1}{k} \cdot 0.02016030244049788 \cdot \text{Cm} \cdot \text{Cstern} \cdot \text{Cw} \int_0^1 \frac{1}{k} \cdot \text{Cp} + \int_0^1 \frac{1}{-1. + 4. \text{Cp}} \cdot 0.121563
\end{aligned}$$

$$\begin{aligned}
& \int_0^1 \frac{x^2}{x^2} \cdot 1.06806 \int_0^1 \frac{x^2}{k} \cdot x^{1.2} \cdot 0.36486 \int_0^1 \frac{x^4}{x^2} \cdot 0.46106 x^5 \cdot \int_0^1 \frac{1}{x} \cdot \text{HH1.} - \text{Cpl}^{0.60247} \\
& \text{H3.6363748627922092} + 0.43429448190325176 \text{ Log} \times 1 x 5 \text{DL}^{2.} \text{L} + \\
& \int_0^1 \frac{1}{k} \cdot 7.463089026259201 \cdot x^4 \cdot x^2 \int_0^1 \frac{1}{k} \cdot 0.0009646830697532433 \cdot \text{Cm} \cdot x^5 \cdot 2. - \\
& \int_0^1 \frac{1}{k} \cdot 0.002823462643180224 \cdot \text{Cm} \cdot x^5 \cdot 2. - \\
& \text{HH00.} + x^{11} \cdot 0.16
\end{aligned}$$

$$\begin{aligned}
& \int_0^1 \frac{1}{k} \cdot 0.032822753226970106 \cdot \text{Cm} \cdot x^5 \cdot 2. - \\
& \text{H3.6363748627922092} + 0.43429448190325176 \text{ Log} \times 1 x 5 \text{DL}^{2.} - \\
& \int_0^1 \frac{1}{k} \cdot 0.017191993447758305 \cdot \text{Cm} \int_0^1 \frac{1}{k} \cdot \text{Cp} + \int_0^1 \frac{1}{-1. + 4. \text{Cp}} \cdot 0.121563
\end{aligned}$$

$$\begin{aligned}
& \int_0^1 \frac{x^2}{x^2} \cdot 1.06806 \int_0^1 \frac{x^2}{k} \cdot x^{1.2} \cdot 0.36486 \int_0^1 \frac{x^4}{x^2} \cdot 0.46106 x^5 \cdot \int_0^1 \frac{1}{x} \cdot \text{HH1.} - \text{Cpl}^{0.60247} \\
& \text{H3.6363748627922092} + 0.43429448190325176 \text{ Log} \times 1 x 5 \text{DL}^{2.} \text{L} + \\
& \int_0^1 \frac{1}{k} \cdot 7.463089026259201 \cdot x^4 \cdot x^2 \int_0^1 \frac{1}{k} \cdot 0.0009646830697532433 \cdot \text{Cm} \cdot x^5 \cdot 2. - \\
& \int_0^1 \frac{1}{k} \cdot 0.002823462643180224 \cdot \text{Cm} \cdot x^5 \cdot 2. - \\
& \text{HH00.} + x^{11} \cdot 0.16
\end{aligned}$$

$$\begin{aligned}
& \left(H_3.6363748627922092 \cdot C_{pl}^{0.60247} + 0.43429448190325176 \cdot \text{Log} @ x_1 x_{5DL}^{2.2} L - \right. \\
& \left. 0.00018911192792534135 \cdot C_{m}^{0.121563} C_{stern} \right) \left(1. - C_p + \frac{C_p}{-1. + 4. C_p} \right) \\
& \left(\frac{x_2}{x_1} \right)^{1.06806} \left(\frac{x_1^2}{C_b x_2 x_4} \right)^{0.36486} \left(\frac{x_4}{x_1} \right)^{0.46106} x_{5^2}^{0.46106} \left(H_3.6363748627922092 \cdot C_{pl}^{0.60247} \right. \\
& \left. H_3.6363748627922092 \cdot C_{pl}^{0.60247} + 0.43429448190325176 \cdot \text{Log} @ x_1 x_{5DL}^{2.2} L + \right. \\
& \left. 7.463089026259201 \cdot x_4^{-7} - 0.2520919703479776 \cdot C_{m}^{0.121563} x_{5^2}^{0.121563} - \right. \\
& 0.246248778982296 \cdot C_b \cdot C_{m}^{0.121563} x_{5^2}^{0.121563} + 0.15926870179600705 \cdot C_m^{3+2} x_{5^2}^{0.121563} - \\
& 0.20568033607199232 \cdot C_m^{0.121563} C_w x_{5^2}^{0.121563} + \\
& \frac{0.737830157116032 \cdot C_m^{0.121563} x_{5^2}^{0.121563}}{H_{100.} + x_{1L}^{0.16}} + \frac{0.72072813360672 \cdot C_b \cdot C_m^{0.121563} x_{5^2}^{0.121563}}{H_{100.} + x_{1L}^{0.16}} - \\
& \frac{0.4661522979395328 \cdot C_m^{3+2} x_{5^2}^{0.121563}}{H_{100.} + x_{1L}^{0.16}} + \\
& \frac{0.6019912275277823 \cdot C_m^{0.121563} C_w x_{5^2}^{0.121563}}{H_{100.} + x_{1L}^{0.16}} + \\
& \frac{8.577275576473872 \cdot C_m^{0.121563} x_{5^2}^{0.121563}}{H_3.6363748627922092 \cdot C_{pl}^{0.60247} + 0.43429448190325176 \cdot \text{Log} @ x_1 x_{5DL}^{2.2} L} + \\
& \frac{8.378464553178121 \cdot C_b \cdot C_m^{0.121563} x_{5^2}^{0.121563}}{H_3.6363748627922092 \cdot C_{pl}^{0.60247} + 0.43429448190325176 \cdot \text{Log} @ x_1 x_{5DL}^{2.2} L} - \\
& \frac{5.419020463547069 \cdot C_m^{3+2} x_{5^2}^{0.121563}}{H_3.6363748627922092 \cdot C_{pl}^{0.60247} + 0.43429448190325176 \cdot \text{Log} @ x_1 x_{5DL}^{2.2} L} + \\
& \frac{6.998148020010469 \cdot C_m^{0.121563} C_w x_{5^2}^{0.121563}}{H_3.6363748627922092 \cdot C_{pl}^{0.60247} + 0.43429448190325176 \cdot \text{Log} @ x_1 x_{5DL}^{2.2} L} + \\
& \left(4.492629380925591 \cdot C_m^{0.121563} \right) \left(1. - C_p + \frac{C_p}{-1. + 4. C_p} \right) \\
& \left(\frac{x_2}{x_1} \right)^{1.06806} \left(\frac{x_1^2}{C_b x_2 x_4} \right)^{0.36486} \left(\frac{x_4}{x_1} \right)^{0.46106} x_{5^2}^{0.46106} \left(H_3.6363748627922092 \cdot C_{pl}^{0.60247} \right. \\
& \left. H_3.6363748627922092 \cdot C_{pl}^{0.60247} + 0.43429448190325176 \cdot \text{Log} @ x_1 x_{5DL}^{2.2} L + \right. \\
& \left. 4.388495587327978 \cdot C_b \cdot C_m^{0.121563} \right) \left(1. - C_p + \frac{C_p}{-1. + 4. C_p} \right) \\
& \left(\frac{x_2}{x_1} \right)^{1.06806} \left(\frac{x_1^2}{C_b x_2 x_4} \right)^{0.36486} \left(\frac{x_4}{x_1} \right)^{0.46106} x_{5^2}^{0.46106} \left(H_3.6363748627922092 \cdot C_{pl}^{0.60247} \right. \\
& \left. H_3.6363748627922092 \cdot C_{pl}^{0.60247} + 0.43429448190325176 \cdot \text{Log} @ x_1 x_{5DL}^{2.2} L - \right.
\end{aligned}$$

$$2.8383896883463664 \cdot \text{Cm}^{3 \cdot 2} \cdot \left(1 - \text{Cp} + \frac{\text{Cp}^2}{-1. + 4. \text{Cp}} \right)^{0.121563}$$

$$\left(\frac{x^2}{x^1} \right)^{1.06806} \cdot \left(\frac{x^{1 \cdot 2}}{\text{Cb} \cdot x^2 \cdot x^4} \right)^{0.36486} \cdot \left(\frac{x^4}{x^1} \right)^{0.46106} \cdot x^{5 \cdot 2}$$

$$\text{H}1 - \text{Cpl}^{0.60247} \cdot \text{H}3.6363748627922092 + 0.43429448190325176 \cdot \text{Log}x1 \cdot x50l^{2 \cdot} \cdot l +$$

$$0.0494189231901815 \cdot \text{Cm} \cdot \text{Cstern} \cdot \left(1 - \text{Cp} + \frac{\text{Cp}^2}{-1. + 4. \text{Cp}} \right)^{0.121563}$$

$$\left(\frac{x^2}{x^1} \right)^{1.06806} \cdot \left(\frac{x^{1 \cdot 2}}{\text{Cb} \cdot x^2 \cdot x^4} \right)^{0.36486} \cdot \left(\frac{x^4}{x^1} \right)^{0.46106} \cdot x^{5 \cdot 2}$$

$$\text{H}1 - \text{Cpl}^{0.60247} \cdot \text{H}3.6363748627922092 + 0.43429448190325176 \cdot \text{Log}x1 \cdot x50l^{2 \cdot} \cdot l +$$

$$0.048273451460607755 \cdot \text{Cb} \cdot \text{Cm} \cdot \text{Cstern} \cdot \left(1 - \text{Cp} + \frac{\text{Cp}^2}{-1. + 4. \text{Cp}} \right)^{0.121563}$$

$$\left(\frac{x^2}{x^1} \right)^{1.06806} \cdot \left(\frac{x^{1 \cdot 2}}{\text{Cb} \cdot x^2 \cdot x^4} \right)^{0.36486} \cdot \left(\frac{x^4}{x^1} \right)^{0.46106} \cdot x^{5 \cdot 2}$$

$$\text{H}1 - \text{Cpl}^{0.60247} \cdot \text{H}3.6363748627922092 + 0.43429448190325176 \cdot \text{Log}x1 \cdot x50l^{2 \cdot} \cdot l -$$

$$0.031222286571810032 \cdot \text{Cm}^{3 \cdot 2} \cdot \text{Cstern} \cdot \left(1 - \text{Cp} + \frac{\text{Cp}^2}{-1. + 4. \text{Cp}} \right)^{0.121563}$$

$$\left(\frac{x^2}{x^1} \right)^{1.06806} \cdot \left(\frac{x^{1 \cdot 2}}{\text{Cb} \cdot x^2 \cdot x^4} \right)^{0.36486} \cdot \left(\frac{x^4}{x^1} \right)^{0.46106} \cdot x^{5 \cdot 2}$$

$$\text{H}1 - \text{Cpl}^{0.60247} \cdot \text{H}3.6363748627922092 + 0.43429448190325176 \cdot \text{Log}x1 \cdot x50l^{2 \cdot} \cdot l +$$

$$3.6655095346359783 \cdot \text{Cm} \cdot \text{Cw} \cdot \left(1 - \text{Cp} + \frac{\text{Cp}^2}{-1. + 4. \text{Cp}} \right)^{0.121563}$$

$$\left(\frac{x^2}{x^1} \right)^{1.06806} \cdot \left(\frac{x^{1 \cdot 2}}{\text{Cb} \cdot x^2 \cdot x^4} \right)^{0.36486} \cdot \left(\frac{x^4}{x^1} \right)^{0.46106} \cdot x^{5 \cdot 2}$$

$$\text{H}1 - \text{Cpl}^{0.60247} \cdot \text{H}3.6363748627922092 + 0.43429448190325176 \cdot \text{Log}x1 \cdot x50l^{2 \cdot} \cdot l +$$

$$0.04032060488099576 \cdot \text{Cm} \cdot \text{Cstern} \cdot \text{Cw} \cdot \left(1 - \text{Cp} + \frac{\text{Cp}^2}{-1. + 4. \text{Cp}} \right)^{0.121563}$$

$$\left(\frac{x^2}{x^1} \right)^{1.06806} \cdot \left(\frac{x^{1 \cdot 2}}{\text{Cb} \cdot x^2 \cdot x^4} \right)^{0.36486} \cdot \left(\frac{x^4}{x^1} \right)^{0.46106} \cdot x^{5 \cdot 2}$$

$$\text{H}1 - \text{Cpl}^{0.60247} \cdot \text{H}3.6363748627922092 + 0.43429448190325176 \cdot \text{Log}x1 \cdot x50l^{2 \cdot} \cdot l +$$

$$7.463089026259201 \cdot \text{AT} \cdot c6 \cdot x5^{2 \cdot} -$$

Appendix L

Mathematical Form of the Cargo Weight and Its Center of Gravity

WCargo =

$$- 1873.9520982571798 \cdot x_1 x_2 + 0.601404 \cdot Ntd + 0.11631177431999998 \cdot x_3L$$

KGCargo =

$$\begin{aligned} & 12 \cdot H - 82.6702 \cdot H + 0.050117 \cdot Ntd x_1 x_2 + 1.83 \cdot H + 1.22 \cdot Ntd + x_3L + \\ & 5.934274199999999 \cdot H - 148.6129 \cdot H + 0.0196 \cdot x_1 x_2 x_3L \\ & 1.83 \cdot H - 1.4709133333333333 \cdot \text{IntegerPart}[0.75 \cdot H] - 0.4098360655737705 \cdot x_3L \cdot \\ & H - 1873.9520982571798 \cdot x_1 x_2 + 0.601404 \cdot Ntd x_1 x_2 + 0.11631177431999998 \cdot x_1 x_2 x_3L \end{aligned}$$

Appendix M

Mathematical Form of the Total Weight

$$\begin{aligned}
 \text{WT} = & 39850.524901742814 + 0.6383652303382383 \cdot \text{Hex}1 \cdot x2 \cdot x3L^{0.724} + 0.07889472174276087 \cdot \text{Hex}1 \cdot x2 \cdot x3L^{1.003} + \\
 & 0.00007321430177728209 \cdot J - 8.3 + \frac{x1^{1.691}}{x3} \cdot \text{Hex}1 \cdot x2 \cdot x3L^{1.003} - 0.022091145858630486 \cdot x5^2 + \\
 & 23.215308859290154 \cdot c6 \cdot x5^2 + \frac{0.06465701226916239 \cdot x5^2}{100} + x1^{0.16} + \\
 & \cdot \frac{1}{x1} J \cdot 0.0001079651852345908 \cdot \bar{a}^{-28.836809873393417} \cdot \frac{1}{-5.7 + x4 + 7.463243262818116 \cdot x2 \cdot x4} \cdot x5^2 - \\
 & 0.0026991296308647703 \cdot c4 \cdot \bar{a}^{-28.836809873393417} \cdot \frac{1}{-5.7 + x4 + 7.463243262818116 \cdot x2 \cdot x4} \cdot x5^2 \cdot \Pi + \\
 & \frac{98.00880709606643}{K} \cdot \bar{a}^{-\frac{0.1717473344813689}{1.63344}} \\
 & \frac{1}{K} \cdot \left(\frac{x5^3}{-74.19790666961431 + 9.807 \cdot x4 + 0.03969110399999999 \cdot x5^2} \right) \\
 & 3.779184373405185 + \\
 & \frac{1}{K} \cdot \left(\frac{x5^2}{-74.19790666961431 + 9.807 \cdot x4 + 0.03969110399999999 \cdot x5^2} \right) + \\
 & x1^{3 \cdot 2} Jx4 J8.493900788895479 \cdot \bar{a}^{-28.836809873393417} \cdot \frac{1}{-5.7 + x4 + 7.463243262818116 \cdot x2 \cdot x4} \cdot x5^2 - \\
 & 0.000021234751972238696 \cdot c4 \cdot \bar{a}^{-28.836809873393417} \cdot \frac{1}{-5.7 + x4 + 7.463243262818116 \cdot x2 \cdot x4} \cdot x5^2 \cdot \Pi + \\
 & x2 J4.208126958189767 \cdot \bar{a}^{-28.836809873393417} \cdot \frac{1}{-5.7 + x4 + 7.463243262818116 \cdot x2 \cdot x4} \cdot x5^2 - \\
 & 0.000010520317395474418 \cdot c4 \cdot \bar{a}^{-28.836809873393417} \cdot \frac{1}{-5.7 + x4 + 7.463243262818116 \cdot x2 \cdot x4} \cdot x5^2 \cdot \Pi + \\
 & \frac{1}{x4} Jx2^2 J - 1.9411718128986405 \cdot \bar{a}^{-28.836809873393417} \cdot \frac{1}{-5.7 + x4 + 7.463243262818116 \cdot x2 \cdot x4} \cdot x5^2 + \\
 & 4.852929532246601 \cdot \bar{a}^{-28.836809873393417} \cdot \frac{1}{-5.7 + x4 + 7.463243262818116 \cdot x2 \cdot x4} \cdot x5^2 \cdot \Pi \Pi + \\
 & x1 \frac{1}{K} \cdot \frac{2.1411550979250913 \cdot \bar{a}^{\frac{1.37565}{90}}}{-hal} \cdot c7^{3.78613} \\
 & \bar{a}^{-28.836809873393417} \cdot \frac{1}{-5.7 + x4 + 7.463243262818116 \cdot x2 \cdot x4} +
 \end{aligned}$$

$$\begin{aligned}
& \left(\frac{5.081833302662383}{x^1} - 1.256962155395367 - \frac{4.79323 \cdot x^2}{x^1} + \right. \\
& \left. \frac{0.0140407 \cdot x^1}{x^4} - \frac{1.5497631635965172 \cdot x^2 \cdot x^4}{x^1 \cdot x^2 \cdot x^4} \right) + \\
& 0 \cdot \bar{a} \cdot \left(\frac{24.150700234490834}{x^1} \cdot \frac{x^4}{x^2} \right)^{1.07961} + \\
& \left(\frac{x^2}{x^4} \right)^{3.9719016423885973} \cdot x^{5^2} - \frac{1.162507797772272 \cdot x^6 \cdot x^{5^2}}{1100 + x^{11} \cdot 0.16} - \\
& \frac{0.000013514153149102662 \cdot x^{5^2}}{3.6363748627922092 + 0.43429448190325176 \cdot \text{Log}@x^1 \cdot x^{50L^2}} - \\
& \left(\frac{0.00001671335405669323}{0.3004 + 0.00014938078291814948 \cdot x^1} \right)^{0.121563} \\
& \left(\frac{x^2}{x^1} \right)^{1.06806} \cdot \left(\frac{x^1}{x^2 \cdot x^4} \right)^{0.36486} \cdot \left(\frac{x^4}{x^1} \right)^{0.46106} \cdot x^{5^2} + \\
& 3.6363748627922092 + 0.43429448190325176 \cdot \text{Log}@x^1 \cdot x^{50L^2} + \\
& x^2 \cdot \left(0.601404 \cdot \text{Ntd} + 0.11631177431999998 \cdot x^3 + \frac{6.405319911589467 \cdot x^6}{90 - \text{hal}^{1.37565}} \right) + \\
& c^{7.78613} \cdot \bar{a} \cdot \left(-28.836809873393417 \cdot \frac{1}{-5.7 + x^4 + 7.463243262818116 \cdot x^2 \cdot x^4} \right) + \\
& \left(\frac{5.081833302662383}{x^1} - 1.256962155395367 - \frac{4.79323 \cdot x^2}{x^1} + \right. \\
& \left. \frac{0.0140407 \cdot x^1}{x^4} - \frac{1.5497631635965172 \cdot x^2 \cdot x^4}{x^1 \cdot x^2 \cdot x^4} \right) + \\
& 0 \cdot \bar{a} \cdot \left(\frac{24.150700234490834}{x^1} \cdot \frac{x^4}{x^2} \right)^{1.07961} - \\
& 0.00008610400308489546 \cdot x^{5^2} + \frac{0.0002520117163460355 \cdot x^{5^2}}{1100 + x^{11} \cdot 0.16} + \\
& \frac{0.002929636202522662 \cdot x^{5^2}}{3.6363748627922092 + 0.43429448190325176 \cdot \text{Log}@x^1 \cdot x^{50L^2}} + \\
& \left(\frac{0.003623167990612766}{0.3004 + 0.00014938078291814948 \cdot x^1} \right)^{0.121563} \\
& \left(\frac{x^2}{x^1} \right)^{1.06806} \cdot \left(\frac{x^1}{x^2 \cdot x^4} \right)^{0.36486} \cdot \left(\frac{x^4}{x^1} \right)^{0.46106} \cdot x^{5^2} + \\
& 3.6363748627922092 + 0.43429448190325176 \cdot \text{Log}@x^1 \cdot x^{50L^2} +
\end{aligned}$$

$$\begin{aligned}
& x^4 - 0.00017379676682674635 x^5 + \frac{0.00050867346388316 x^5}{100 + x^{1.16}} + \\
& \frac{0.0059133290176417354 x^5}{3.6363748627922092 + 0.43429448190325176 \log(x) x^{50}} + \\
& \frac{0.007313189397452305}{0.3004 + 0.00014938078291814948 x^{0.121563}} \\
& \left(\frac{x^2}{x^1} \right)^{1.06806} \left(\frac{x^2}{x^2 x^4} \right)^{0.36486} \left(\frac{x^4}{x^1} \right)^{0.46106} x^{5^2} + \\
& 3.6363748627922092 + 0.43429448190325176 \log(x) x^{50} + \\
& 0.0011569131025314175 x^5 - \frac{1.5466546977017742 \cdot 10^7 c^{7.78613}}{90 - \frac{1}{2} \ln \frac{1}{3.65}} \\
& \frac{a^3}{k} - 28.836809873393417 \frac{-5.7 + x^4 + 7.463243262818116 x^2 x^4}{x^4} + \\
& \frac{5.081833302662383}{x^1} - 1.256962155395367 - \frac{4.79323 x^2}{x^1} + \\
& \frac{0.0140407 x^1}{x^4} - \frac{1.5497631635965172 x^2 x^4}{x^1 x^2 x^4} + \\
& 0. \frac{a}{k} \cos \left(\frac{24.150700234490834}{x^1 x^2} \right) \\
& J_1 - \frac{334.27762039660064}{x^2 x^4} x^4 \frac{1.07961}{x^2} + 56056.632613855996 c_6 x^{5^2} + \\
& 135.730345312 - 0.00205 + 0.000010018884088099185 - 0.0002504721022024796 \\
& c_4 \frac{a}{k} - 28.836809873393417 \frac{-5.7 + x^4 + 7.463243262818116 x^2 x^4}{x^4} \cdot \frac{0.006}{x^1} + \frac{0.006}{100 + x^{1.16}} \\
& \frac{191.70788141720897}{k} + x^1 \frac{0.7472141154913118}{k} x^2 - \\
& \frac{0.0034468327443611183 x^2}{x^4} + 1.5082155619600681 x^4 \\
& x^{5^2} + \frac{236656.06714975525 a}{k} \frac{-0.171732344812688}{1 - 8.55 + x^4} \\
& \frac{-74.19790666961431 + 9.807 x^4 + 0.03969110399999999 x^5}{k} x^5 \frac{1}{k} \frac{1}{k} \\
& 13.779184373405185 + 1. \ln x^5 - 74.19790666961431 + 9.807 x^4 +
\end{aligned}$$

$$\begin{aligned}
& 0.0396911039999999 \cdot x^5 + 10.179775898399999 \cdot x^4 \\
& + 0.93 \cdot x^3 + 1.1501585856866496 \cdot x^2 + 0.3004 \cdot x + 0.00014938078291814948 \\
& + 0.121563 \cdot x^0 \\
& + 191.70788141720897 \cdot x^2 - 0.7472141154913118 \cdot x^2 - \\
& 0.0034468327443611183 \cdot x^2 + 1.5082155619600681 \cdot x^4 + 1.5082155619600681 \cdot x^5 \\
& + 3.6363748627922092 \cdot x^3 + 0.43429448190325176 \cdot \log(x) \cdot x^5 + 0.775 \cdot x^5 \\
& + 0.7516377676290127 \cdot x^5 + 3.6363748627922092 \cdot x^3 + 0.43429448190325176 \cdot \log(x) \cdot x^5 \\
& + 0.929572722327802 \cdot x^3 \\
& + 0.3004 \cdot x + 0.00014938078291814948 \cdot x^0 \\
& + 1.06806 \cdot x^2 \\
& + 0.36486 \cdot x^2 \\
& + 0.46106 \cdot x^4 \\
& + 1.5082155619600681 \cdot x^5
\end{aligned}$$

Appendix N

Mathematical Form of the Center of Gravity of the Total Weight

KG =

$$\begin{aligned}
 & 20862.238499999996 \cdot x^3 + 0.19150956910147154 \cdot Hx1 \cdot x2 \cdot x3L^{0.724} + \\
 & 0.02366841652282826 \cdot Hx1 \cdot x2 \cdot x3L^{1.003} + 0.00002196429053318463 \cdot J - 8.3 \cdot \frac{x1^{1.691}}{x3} \\
 & Hx1 \cdot x2 \cdot x3L^{1.003} + 12 \cdot H - 82.6702 + 0.050117 \cdot Ntd \cdot x1 \cdot x2 \cdot H1.83 + 1.22 \cdot Ntd + x3L + \\
 & 5.9342741999999999 \cdot H - 148.6129 + 0.0196 \cdot x1 \cdot x2 \cdot x3L \\
 & H1.83 - 1.4709133333333333 \cdot \text{IntegerPart} @ 0.75 - 0.4098360655737705 \cdot x3DL + \\
 & x3L^{0.6415570564899296} \cdot Hx1 \cdot x2 \cdot x3L^{0.724} - 0.00043983364370304626 \cdot x1 \cdot Hx1 \cdot x2 \cdot x3L^{0.724} + \\
 & 0.03817242216801743 \cdot Hx1 \cdot x2 \cdot x3L^{1.003} + 0.00003542400777192017 \cdot J - 8.3 \cdot \frac{x1^{1.691}}{x3} \\
 & Hx1 \cdot x2 \cdot x3L^{1.003} + 0.00001890727785509613 \cdot J \frac{x1^2}{x3} \cdot Hx1 \cdot x2 \cdot x3L^{1.003} + \\
 & 1.7545953849529205 \cdot \wedge{-8} J - 8.3 \cdot \frac{x1^{1.691}}{x3} \cdot J \frac{x1^2}{x3} \cdot Hx1 \cdot x2 \cdot x3L^{1.003} + \\
 & 0.0005437491581897661 \cdot x5 \cdot \left[\frac{H90 \cdot \text{hal}^{1.3/565}}{k} \right] \cdot 1.5466546977017742 \cdot \wedge{10} c7^{3.78613} \cdot \bar{a} \wedge \\
 & - 28.836809873393417 \cdot \$ \left[\frac{6.387672141474464}{x1^{1.9}} - \frac{24.358395841320416 \cdot x2}{x1^{1.9}} + \right. \\
 & \left. \frac{0.07135249685269171 \cdot x1}{x4 \cdot x1^{1.9}} - \frac{7.875638056004192 \cdot x2 \cdot x4}{Hx1 \cdot x2 \cdot x4L^{0.6666666666666667} \cdot x1^{1.9}} + \right. \\
 & \left. 0 \cdot \bar{a} \cdot \left[\frac{-12.052161110505605}{x1^{1.9}} \right] \cdot \text{CosB} \left[\frac{24.150700234490834}{x1} \right] \right. \\
 & \left. x1 \cdot J \frac{x4^{1.07961}}{x2} \cdot H - 334.27762039660064 + 1 \cdot x2 \cdot x4L \right. \\
 & \left. 56056.632613855996 \cdot c6 \cdot x5^2 + 135.730345312 \cdot J - 0.00205 \right.
 \end{aligned}$$

$$10.000010018884088099185 - 0.0002504721022024796 c4L$$

$$\bar{a} - 28.836809873393417 \sqrt{-5.7 + x^4 + 7.463243262818116 x^2 x^4} \cdot \frac{1}{x^1} + \frac{0.006}{1100. + x^{11^{0.16}}}$$

$$\int_0^1 191.70788141720897 + x^1 \int_0^1 0.7472141154913118 x^2 -$$

$$\frac{0.0034468327443611183 x^2}{x^4} + 1.5082155619600681 x^4 x^5 x^2 +$$

$$\int_0^1 236656.06714975525 \bar{a} \sqrt{-0.1717473244913686} |x^5 - 1| H - 74.19790666961431 +$$

$$9.807 x^4 + 0.0396911039999999 x^5 LMM^3$$

$$13.779184373405185 + 1 |x^5 - 1| H - 74.19790666961431 +$$

$$9.807 x^4 + 0.0396911039999999 x^5 LMM^2 M +$$

$$\int_0^1 10.179775898399999 \int_0^1 0.93 + 1.1501585856866496$$

$$\int_0^1 \frac{0.3004 + 0.00014938078291814948 x^1}{0.121563 x^2 + 1.06806 x^1}$$

$$\int_0^1 \frac{x^{1.2}}{x^2 x^4} \sqrt{0.36486} \int_0^1 \frac{x^4}{x^1} \sqrt{0.46106} \int_0^1 191.70788141720897 +$$

$$x^1 \int_0^1 0.7472141154913118 x^2 - \frac{0.0034468327443611183 x^2}{x^4} +$$

$$1.5082155619600681 x^4 x^5 x^2$$

$$H3.6363748627922092 + 0.43429448190325176 \text{Log} x^1 x^5 D^{2.775} +$$

$$3.090765690163143 \sqrt{-10} \int_0^1 \frac{1.5466546977017742 \sqrt{-10} c^{7^{3.78613}}}{H90 - \text{hal}^{1.37565}}$$

$$\bar{a} \int_0^1 -28.836809873393417 \sqrt{-5.7 + x^4 + 7.463243262818116 x^2 x^4} +$$

$$\int_0^1 \frac{5.081833302662383}{x^1} \int_0^1 -1.256962155395367 - \frac{4.79323 x^2}{x^1} +$$

$$\frac{0.0140407 x^1}{x^4} - \frac{1.5497631635965172 x^2 x^4}{Hx^1 x^2 x^4}$$

$$0. \bar{a} \int_0^1 \frac{24.150700234490834}{x^1} \text{Cos} B \int_0^1 \frac{1}{x^1}$$

$$x^2 J1. - \frac{334.27762039660064}{x^2 x^4} x^4 \int_0^1 \frac{x^4}{x^2} \sqrt{1.07961} +$$

$$56056.632613855996 c_6 x^5 + 135.730345312$$

$$\int -0.00205 + 10.000010018884088099185 - 0.0002504721022024796 c_4$$

$$\bar{a} - 28.836809873393417 \cdot \frac{0.006}{100 + x^{1.16}}$$

$$\int 191.70788141720897 + x \int 0.7472141154913118 x^2 -$$

$$\frac{0.0034468327443611183 x^2}{x^4} + 1.5082155619600681 x^4$$

$$x^5 + 236656.06714975525 \bar{a} - \frac{0.17173334813688}{8.5}$$

$$\int -74.19790666961431 + 9.807 x^4 + 0.03969110399999999 x^5 - 3.779184373405185 + 1.1 x^5 - 74.19790666961431 + 9.807 x^4 +$$

$$0.03969110399999999 x^5 + 10.179775898399999$$

$$\int 0.93 + 1.1501585856866496 \int \frac{1}{0.3004 + 0.00014938078291814948 x^{1.121563}}$$

$$\int \frac{x^2}{x^1} \cdot \int \frac{x^{1.06806}}{x^2 x^4} \cdot \int \frac{x^{0.36486}}{x^2 x^4} \cdot \int \frac{x^{0.46106}}{x^1}$$

$$\int 191.70788141720897 + x \int 0.7472141154913118 x^2 -$$

$$\frac{0.0034468327443611183 x^2}{x^4} + 1.5082155619600681 x^4 x^5$$

$$3.6363748627922092 + 0.43429448190325176 \text{Log} x^5 + 2$$

$$0.0003470739307594252 \int x^5 \int \frac{1}{100 - \text{hal}^{1.37565}} \int 1.5466546977017742 \cdot 10^7 x^{3.78613}$$

$$\bar{a} - 28.836809873393417 \cdot \frac{1}{-5.7 + x^4 + 7.463243262818116 x^2 x^4}$$

$$\frac{6.387672141474464}{x^1} - \frac{24.358395841320416 x^2}{x^1 x^1}$$

$$\frac{0.07135249685269171 x^1}{x^4 x^1} - \frac{7.875638056004192 x^2 x^4}{x^1 x^2 x^4}$$

$$0 \cdot \bar{a} \cdot \text{CosB} \frac{24.150700234490834}{x^1}$$

$$\begin{aligned}
& x^4 \int \frac{1.07961}{x^2} dx - 334.27762039660064 + 1. x^2 x^4 + \\
& 56056.632613855996 x^6 + 135.730345312 x^4 \\
& - 0.00205 x^3 + 0.000010018884088099185 x^2 - 0.0002504721022024796 x \\
& a - 28.836809873393417 \cdot \frac{0.006}{100 + x^2} + \\
& \int 191.70788141720897 + x \int 0.7472141154913118 x^2 - \\
& \frac{0.0034468327443611183 x^2}{x^4} + 1.5082155619600681 x^4 x^5 + \\
& \int 236656.06714975525 a - \frac{0.1717473344813688}{x^5} |x^5| - 74.19790666961431 + \\
& 9.807 x^4 + 0.03969110399999999 x^5 \ln^3 x \\
& 13.779184373405185 + 1. |x^5| - 74.19790666961431 + 9.807 x^4 + \\
& 0.03969110399999999 x^5 \ln^2 x + \\
& \int 10.179775898399999 \int 0.93 + 1.1501585856866496 \\
& \int \frac{0.121563}{0.3004 + 0.00014938078291814948 x^2} \\
& \int \frac{x^2}{x^2} \int \frac{x^2}{x^2} \int \frac{x^2}{x^2} \int \frac{x^2}{x^2} \\
& \int 191.70788141720897 + x \int 0.7472141154913118 x^2 - \\
& \frac{0.0034468327443611183 x^2}{x^4} + 1.5082155619600681 x^4 x^5 + \\
& 3.6363748627922092 + 0.43429448190325176 \log x^5 \ln^2 x^{0.775} \\
& \int 39850.524901742814 + 0.601404 \ln x^2 + 0.11631177431999998 \\
& x^1 \\
& x^2 \\
& x^3 + \\
& 1.03 \\
& \int 0.6197720682895518 \ln x^2 x^3 \ln^{0.724} + \\
& 0.07659681722598143 \\
& \int 1. + 0.000928 \int - 8.3 + \frac{x^1}{x^3} \int 1.691
\end{aligned}$$

$$\begin{aligned}
& Hx1 x2 x3L^{1.003} + 0.0011232166043994344 \\
& \left[x5 \right] \left[\frac{1.5466546977017742 \cdot 10^{3.78613}}{x2 x4} \right] \left[\frac{-28.836809873393417}{x1} \right] \\
& \left[\frac{-5.7}{x4} + \frac{7.463243262818116}{x2 x4} \right] \left[\frac{5.081833302662383}{x1} \right] \left[\frac{-1.256962155395367}{x1} \right] \left[\frac{4.79323 \cdot x2}{x1} \right] + \\
& \left[\frac{0.0140407 \cdot x1}{x4} \right] \left[\frac{-1.5497631635965172 \cdot x2 x4}{Hx1 x2 x4L^{1.666666666666667}} \right] \left[\frac{0.1205314114585665}{x1} \right] \left[\frac{24.150700234490834}{x1} \right] \left[\frac{0.006}{H100. + x1L^{0.16}} \right] \\
& \left[\frac{334.27762039660064}{x2 x4} \right] \left[\frac{x4}{x2} \right] \left[\frac{1.07961}{x2} \right] + \\
& 56056.632613855996 \cdot c6 x5^{2.} + 135.730345312 \cdot \left[\frac{-0.00205}{x1} \right] + \\
& H0.000010018884088099185 - 0.0002504721022024796 \cdot c4L \\
& \left[\frac{-28.836809873393417}{x1} \right] \left[\frac{0.006}{H100. + x1L^{0.16}} \right] \\
& \left[\frac{191.70788141720897}{x1} \right] \left[\frac{0.7472141154913118 \cdot x2}{x1} \right] - \\
& \left[\frac{0.0034468327443611183 \cdot x2^2}{x4} \right] \left[\frac{1.5082155619600681 \cdot x4}{x4} \right] \left[\frac{x5^2}{x4} \right] + \\
& \left[\frac{236656.06714975525}{x1} \right] \left[\frac{-0.171773214812688}{x1} \right] \left[\frac{1}{x5} \right] \left[\frac{1}{x1} \right] \left[\frac{-74.19790666961431}{x1} \right] + \\
& 9.807 \cdot x4 + 0.03969110399999999 \cdot x5^2 \cdot LMM^3 \cdot \left[\frac{1}{x1} \right] \\
& 13.779184373405185 + 1. \cdot \left[\frac{1}{x5} \right] \left[\frac{1}{x1} \right] \left[\frac{-74.19790666961431}{x1} \right] + \\
& 9.807 \cdot x4 + 0.03969110399999999 \cdot x5^2 \cdot LMM^2 \cdot \left[\frac{1}{x1} \right] + \\
& \left[\frac{10.179775898399999}{x1} \right] \left[\frac{0.93}{x1} \right] + 1.1501585856866496 \\
& \left[\frac{0.3004}{x1} \right] + 0.00014938078291814948 \cdot x1 \left[\frac{0.121563}{x1} \right] \left[\frac{x2}{x1} \right] \left[\frac{1.06806}{x1} \right] \\
& \left[\frac{x1^{12}}{x2 x4} \right] \left[\frac{0.36486}{x1} \right] \left[\frac{x4}{x1} \right] \left[\frac{0.46106}{x1} \right] \left[\frac{191.70788141720897}{x1} \right] + \\
& x1 \left[\frac{0.7472141154913118 \cdot x2}{x1} \right] - \left[\frac{0.0034468327443611183 \cdot x2^2}{x4} \right] + \\
& 1.5082155619600681 \cdot x4 \left[\frac{x5^2}{x4} \right] \left[\frac{1}{x1} \right]
\end{aligned}$$

$$\begin{aligned}
& 3.6363748627922092 + 0.43429448190325176 \operatorname{Log} x + 1.5 \ln^2 x + 0.775 x + \\
& 0.00041414026809651473 \ln^3 x - 1.5466546977017742 x^{-1} + 10 c_7^{3.78613} \\
& \bar{a}^3 - 28.836809873393417 x^5 - 5.7 x^4 + 7.463243262818116 x^2 x^4 + \\
& 5.081833302662383 x^3 - 1.256962155395367 x^2 - \frac{4.79323 x^2}{x^1} + \\
& \frac{0.0140407 x^1}{x^4} - \frac{1.5497631635965172 x^2 x^4}{x^1 x^2 x^4} + \\
& 0. \bar{a} \cos \left(\frac{24.150700234490834}{x^1} \right) \\
& x^2 J_1 - \frac{334.27762039660064 x^4}{x^2 x^4} + \frac{x^4}{x^2}^{1.07961} + \\
& 56056.632613855996 c_6 x^5 + 135.730345312 \\
& -0.00205 x^5 + 10.000010018884088099185 x^5 - 0.0002504721022024796 c_4 \\
& \bar{a} - 28.836809873393417 x^5 - 5.7 x^4 + 7.463243262818116 x^2 x^4 \cdot \frac{0.006}{x^1} + \frac{0.006}{100 x^1 + x^{1.16}} \\
& 191.70788141720897 x^5 + x^1 \left(0.7472141154913118 x^2 - \right. \\
& \left. \frac{0.0034468327443611183 x^2}{x^4} + 1.5082155619600681 x^4 \right) \\
& x^5 + 236656.06714975525 \bar{a} - \frac{0.1717472241812688}{-8.55 + x^4} \\
& -74.19790666961431 x^5 + 9.807 x^4 + 0.03969110399999999 x^5 \\
& 3.779184373405185 x^5 + \\
& 1. -74.19790666961431 x^5 + 9.807 x^4 + 0.03969110399999999 x^5 + 2. \\
& 10.179775898399999 x^5 + 0.93 x^5 + 1.1501585856866496 \\
& \frac{0.121563}{0.3004 + 0.00014938078291814948 x^1}
\end{aligned}$$

$$\int_0^1 \frac{x^2}{x^1} dx + 1.06806 \int_0^1 \frac{x^{1.2}}{x^2 x^4} dx + 0.36486 \int_0^1 \frac{x^4}{x^1} dx + 0.46106 \int_0^1 \frac{x^4}{x^1} dx$$

$$= 191.70788141720897 + x \int_0^1 0.7472141154913118 x^2 -$$

$$\frac{0.0034468327443611183 x^2}{x^4} + 1.5082155619600681 x^4 x^5 x^2$$

$$= 3.6363748627922092 + 0.43429448190325176 \log(x) x^5$$

Appendix O

Mathematical Form of the Annual Building Cost

Abc =

$$\begin{aligned}
 & 751.5897375985036 \cdot Hx1 \cdot x2 \cdot x3L^{0.5429999999999999} + 219.041457381057 \cdot Hx1 \cdot x2 \cdot x3L^{0.6516} + \\
 & 165.5863587991675 \cdot Hx1 \cdot x2 \cdot x3L^{0.724} + 3.7845343417976673 \cdot Hx1 \cdot x2 \cdot x3L^{1.003} + \\
 & 0.0035120478691882356 \cdot J - 8.3 + \frac{x1}{x3} \cdot Hx1 \cdot x2 \cdot x3L^{1.003} + \\
 & 3.8290775754094026 \cdot \frac{1}{kk} \cdot 1 + 0.000928 \cdot J - 8.3 + \frac{x1}{x3} \cdot Hx1 \cdot x2 \cdot x3L^{1.003} \cdot \frac{0.85}{\{}} + \\
 & 22902.936148711604 \cdot \frac{1}{k} \cdot 2.2604108721379874 \cdot Hx1 \cdot x2 \cdot x3L^{0.1666666666666666} + \\
 & 0.5373968269457794 \cdot \frac{1}{k} \cdot x5 \cdot \frac{1}{k} \cdot H90 \cdot - \cdot hal^{1.37565} \cdot \frac{1}{k} \cdot 1.5466546977017742 \cdot * \wedge 10 c^{7.78613} \cdot \bar{a} \wedge \\
 & - 28.836809873393417 \cdot \$ \cdot \frac{1}{k} \cdot -5.7 + x4 + 7.463243262818116 \cdot x2 \cdot x4 - \\
 & \frac{6.387672141474464}{x1} - \frac{24.358395841320416 \cdot x2}{x1} + \\
 & \frac{0.07135249685269171 \cdot x1}{x4} - \frac{7.875638056004192 \cdot x2 \cdot x4}{Hx1 \cdot x2 \cdot x4L^{0.6666666666666667}} + \\
 & 0 \cdot \bar{a} \cdot \frac{1}{k} \cdot \frac{1}{x1} \cdot \frac{1}{\{}} \cdot \text{CosB} \cdot \frac{24.150700234490834}{x1} \cdot \frac{1}{\{}} \\
 & x1 \cdot \frac{x4}{x2} \cdot H - 334.27762039660064 + 1 \cdot x2 \cdot x4L + \\
 & 56056.632613855996 \cdot c6 \cdot x5^{2.2} + 135.730345312 \cdot \\
 & \frac{1}{k} \cdot -0.00205 + H0.000010018884088099185 - 0.0002504721022024796 \cdot c4L \\
 & \bar{a} - 28.836809873393417 \cdot \frac{1}{k} \cdot \frac{1}{x1} \cdot \frac{1}{\{}} \cdot \frac{0.006}{H100 \cdot + x1L^{0.16}} \cdot \frac{1}{\{}} \\
 & \frac{1}{k} \cdot 191.70788141720897 + x1 \cdot \frac{1}{k} \cdot 0.7472141154913118 \cdot x2 - \\
 & \frac{0.0034468327443611183 \cdot x2^2}{x4} + 1.5082155619600681 \cdot x4 \cdot x5^{2.2} +
 \end{aligned}$$

$$\begin{aligned}
& \int_K 236656.06714975525 \bar{a}^{-\frac{127127246322828}{8.55+x^4}} |x^5 \cdot l' H - 74.19790666961431| + \\
& 9.807 x^4 + 0.03969110399999999 x^5 \cdot \text{LMM}^3 \cdot \sqrt{\quad} \\
& 13.779184373405185 + 1 \cdot |x^5 \cdot l' H - 74.19790666961431| + \\
& 9.807 x^4 + 0.03969110399999999 x^5 \cdot \text{LMM}^2 \cdot \sqrt{\quad} + \\
& \int_K 10.179775898399999 \int_K 0.93 + 1.1501585856866496 \\
& \int_K \left(\frac{0.3004 + 0.00014938078291814948 x^1}{x^1} \right)^{0.121563} \int_K \left(\frac{x^2}{x^1} \right)^{1.06806} \\
& \int_K \left(\frac{x^2}{x^2 x^4} \right)^{0.36486} \int_K \left(\frac{x^4}{x^1} \right)^{0.46106} \int_K 191.70788141720897 + \\
& x^1 \int_K 0.7472141154913118 x^2 - \frac{0.0034468327443611183 x^2}{x^4} + \\
& 1.5082155619600681 x^4 \cdot \sqrt{\quad} x^5 \cdot \sqrt{\quad} \\
& H3.6363748627922092 + 0.43429448190325176 \text{Log} x^1 x^5 \text{DL}^2 \cdot \sqrt{\quad} \sqrt{\quad} \\
& 0.56 + 11.464252576067247 x^5 \int_K \int_K 1.5466546977017742 \cdot *^{\wedge} 10 \\
& c7^{3.78613} \bar{a}^{\int_K} - 28.836809873393417 \cdot \int_K \int_K -5.7 + x^4 + 7.463243262818116 x^2 x^4 \\
& \frac{6.387672141474464}{x^1} - \frac{24.358395841320416 x^2}{x^1} + \\
& \frac{0.07135249685269171 x^1}{x^4} - \frac{7.875638056004192 x^2 x^4}{Hx^1 x^2 x^4} + \\
& 0 \cdot \bar{a}^{-\frac{127127246322828}{8.55+x^4}} \text{Cos} B \frac{24.150700234490834}{x^1} \\
& x^1 \int_K \frac{x^4}{x^2} \int_K H - 334.27762039660064 + 1 \cdot x^2 x^4 \int_K + \\
& 56056.632613855996 c6 x^5 \cdot + 135.730345312 \\
& \int_K -0.00205 + H0.000010018884088099185 - 0.0002504721022024796 c4L \\
& \bar{a}^{-28.836809873393417} \int_K \int_K -5.7 + x^4 + 7.463243262818116 x^2 x^4 \cdot \int_K \int_K + \frac{0.006}{H100. + x^1 L^{0.16}} \sqrt{\quad} \\
& \int_K 191.70788141720897 + x^1 \int_K 0.7472141154913118 x^2 -
\end{aligned}$$

Appendix P

Mathematical Form of the Annual Operating Cost

Aoc =

$$Ss + H700 \cdot H0.3572 + 0.0187 \cdot x1L H20 + 0.0029000000000000002 \cdot x1 \cdot x2 \cdot x3L \cdot x5L \cdot \\ H104.1833333333332 + 0.28061479207009726 \cdot x5 + x1 H5.454166666666667 + \\ H0.0374 + 0.000139213888888889 \cdot Ntd \cdot x2 + 0.00002692402183333333 \cdot x2 \cdot x3L \cdot x5LL +$$

$$1.4 \cdot \left\{ \frac{10000}{k} + 0.007 \cdot \left\{ \frac{3937.158241252898}{k} \cdot Hx1 \cdot x2 \cdot x3L^{0.542999999999999} \right\} \right\} +$$

$$1147.43567662251 \cdot Hx1 \cdot x2 \cdot x3L^{0.6516} + 1340.5493954673384 \cdot Hx1 \cdot x2 \cdot x3L^{0.724} +$$

$$30.63872689039257 \cdot \left\{ \frac{1}{k} + 0.000928 \cdot J - 8.3 \right\} + \left\{ \frac{x1}{x3} \right\}^{1.691} \cdot \left\{ \frac{Hx1 \cdot x2 \cdot x3L^{1.003}}{k} \right\} +$$

$$20.058395662226516 \cdot \left\{ \frac{1}{kk} + 0.000928 \cdot J - 8.3 \right\} + \left\{ \frac{x1}{x3} \right\}^{1.691} \cdot \left\{ \frac{Hx1 \cdot x2 \cdot x3L^{1.003}}{k} \right\}^{0.85} +$$

$$81.3442803654393 \cdot \left\{ \frac{x5}{k} \right\} \cdot \left\{ \frac{H90 - hal}{k} \right\}^{1.37565}$$

$$\left\{ \frac{1.5466546977017742 \cdot 10^7 \cdot c7^{3.78613} \cdot \bar{a}}{k} \right\} - 28.836809873393417$$

$$\$ \left\{ \frac{-5.7 + x4 + 7.463243262818116 \cdot x2 \cdot x4}{1} \right\} + \left\{ \frac{1}{x1} \right\}^{0.9}$$

$$\left\{ \frac{5.081833302662383}{k} \right\} - 1.256962155395367 - \left\{ \frac{4.79323 \cdot x2}{x1} \right\} +$$

$$\left\{ \frac{0.0140407 \cdot x1}{x4} \right\} - \left\{ \frac{1.5497631635965172 \cdot x2 \cdot x4}{Hx1 \cdot x2 \cdot x4L^{0.666666666666667}} \right\} +$$

$$0 \cdot \bar{a} \cdot \left\{ \frac{13.053161110505605}{k \cdot x1} \right\} \cdot \text{CosB} \left\{ \frac{24.150700234490834}{1} \right\}$$

$$x1 \cdot x2 \cdot J1 \cdot \left\{ \frac{334.27762039660064}{x2 \cdot x4} \right\} \cdot \left\{ \frac{x4}{x2} \right\}^{1.07961} +$$

$$56056.632613855996 \cdot c6 \cdot x5^2 + 135.730345312 \cdot \left\{ \frac{1}{k} \right\} - 0.00205 +$$

$$H0.000010018884088099185 - 0.0002504721022024796 \cdot c4L$$

$$\bar{a} - 28.836809873393417 \cdot \left\{ \frac{-5.7 + x4 + 7.463243262818116 \cdot x2 \cdot x4}{1} \right\} + \left\{ \frac{1}{x1} \right\}^{0.9}$$

$$\left\{ \frac{0.006}{H100 + x1L^{0.16}} \right\} \cdot \left\{ \frac{191.70788141720897}{k} \right\} +$$

$$56056.632613855996 c6 x5^{2^} + 135.730345312^$$

$$\int_k -0.00205^ + H0.000010018884088099185^ - 0.0002504721022024796^ c4L$$

$$\bar{a} - 28.836809873393417^ \cdot \frac{1}{x1} + \frac{0.006^}{H100.^ + x1L^{0.16}}$$

$$\int_k 191.70788141720897^ + x1 \int_k 0.7472141154913118^ x2 -$$

$$\frac{0.0034468327443611183^ x2^}{x4} + 1.5082155619600681^ x4 \frac{xy}{x1} x5^{2^} +$$

$$\int_k 236656.06714975525^ \bar{a} \frac{-0.17177314813655^}{1=8.55^ x4} |x5^ |' H-74.19790666961431^ +$$

$$9.807^ x4 + 0.03969110399999999^ x5^{2^} LMM^3.^ \frac{y}{x1}$$

$$13.779184373405185^ + 1.^ |x5^ |' H-74.19790666961431^ +$$

$$9.807^ x4 + 0.03969110399999999^ x5^{2^} LMM^2.^ M +$$

$$\int_k 10.179775898399999^ \int_k 0.93^ + 1.1501585856866496^$$

$$\int_k \frac{0.3004^ + 0.00014938078291814948^ x1}{0.121563^} \int_k \frac{x2^{1.06806^}}{x1}$$

$$\int_k \frac{x^{2^}}{x2 x4} \frac{0.36486^}{x1} \int_k \frac{x^4}{x1} \frac{0.46106^}{x1} \int_k 191.70788141720897^ +$$

$$x1 \int_k 0.7472141154913118^ x2 - \frac{0.0034468327443611183^ x2^}{x4} +$$

$$1.5082155619600681^ x4 \frac{xy}{x1} x5^{2^} \frac{y}{x1}$$

$$H3.6363748627922092^ + 0.43429448190325176^ \text{Log}x1 x5DL^{2^} \frac{xy}{x1} \wedge 0.2^ \frac{y}{x1}$$

$$0.8^ + 1688.75^ \int_k 2.2604108721379874^ Hx1 x2 x3L^{0.1666666666666666^} +$$

$$0.5373968269457794^$$

$$\int_k x5 \int_k \frac{1.5466546977017742^ * \wedge 10 c7^{3.78613^} \bar{a} \wedge}{H90.^ - hal^{1.37565^}} \int_k - 28.836809873393417^$$

$$\frac{\$}{-5.7^ + x4 + 7.463243262818116^ x2 x4} + \frac{1}{x1} \frac{0.9^}{x1}$$

$$\int_k 5.081833302662383^ \int_k - 1.256962155395367^ - \frac{4.79323^ x2}{x1} +$$

$$\frac{0.0140407^ x1}{x4} - \frac{1.5497631635965172^ x2 x4}{Hx1 x2 x4L^{0.6666666666666667^}} \frac{xy}{x1} +$$

$$\begin{aligned}
& 0. \bar{a} \cos \left(\frac{24.150700234490834}{x^2} \right) \\
& x^2 J_1 - \frac{334.27762039660064}{x^2 x^4} x^4 J_2 + \frac{1.07961}{x^2} \\
& 56056.632613855996 c_6 x^{5^2} + 135.730345312 \\
& \int_k -0.00205 + H_0.000010018884088099185 - 0.0002504721022024796 c_4 \\
& \bar{a}^{-28.836809873393417} \cdot \frac{0.006}{x^2} + \frac{0.006}{100. + x^2} \\
& \int_k 191.70788141720897 + x^2 \int_k 0.7472141154913118 x^2 - \\
& \frac{0.0034468327443611183 x^2}{x^4} + 1.5082155619600681 x^4 x^{5^2} + \\
& \int_k 236656.06714975525 \bar{a}^{-0.17177334481368} |x^5 - 1| H - 74.19790666961431 + \\
& 9.807 x^4 + 0.03969110399999999 x^{5^2} \ln^3 \\
& 13.779184373405185 + 1. |x^5 - 1| H - 74.19790666961431 + \\
& 9.807 x^4 + 0.03969110399999999 x^{5^2} \ln^2 + \\
& \int_k 10.179775898399999 \int_k 0.93 + 1.1501585856866496 \\
& \int_k \frac{0.3004 + 0.00014938078291814948}{x^2} + \frac{0.121563}{x^2} \frac{1.06806}{x^2} \\
& \int_k \frac{x^2}{x^2 x^4} \frac{0.36486}{x^4} \frac{0.46106}{x^2} \int_k 191.70788141720897 + \\
& x^2 \int_k 0.7472141154913118 x^2 - \frac{0.0034468327443611183 x^2}{x^4} + \\
& 1.5082155619600681 x^4 x^{5^2} \ln^2 \\
& H_3.6363748627922092 + 0.43429448190325176 \log x |x^5|^{0.2}
\end{aligned}$$

Appendix Q

Mathematical Form of the Annual Fuel Cost

Afc =

$$\begin{aligned}
 & 11.595927506702413 \cdot H - 0.3572 \cdot x1 - 0.0187 \cdot x1^5 \\
 & - 2.2366662295036503 \cdot c^{7.78613} \cdot Cb \cdot \bar{a} - 1.41434649220055 \cdot \\
 & \left(\frac{ABT^{1.5}}{-hb + x4 + ABT \cdot x2 \cdot x4} + \frac{1}{x1} \right) \cdot 5.081833302662383 \cdot \\
 & - c16 - \frac{4.79323 \cdot x2}{x1} + \frac{0.0140407 \cdot x1}{x4} - \frac{1.75254 \cdot Cb \cdot x2 \cdot x4}{H \cdot Cb \cdot x1 \cdot x2 \cdot x4^{0.6666666666666667}} + \\
 & 0. \cdot \bar{a} \cdot \cos B \cdot \frac{-13.34248601399447 \cdot + 53.59231882287779 \cdot Cp}{x1} \\
 & x1 \cdot x2 \cdot J1 \cdot \left(\frac{0.8 \cdot AT}{Cm \cdot x2 \cdot x4} \cdot x4 \cdot \frac{1.07961}{x2} \right) + 135.730345312 \cdot AT \cdot c6 \cdot x5^2 + \\
 & 135.730345312 \cdot -0.00205 \cdot -0.0010954451150103322 \cdot H - 0.04 \cdot + 1 \cdot c4 \\
 & Cb^4 \cdot \bar{a}^{-1.41434649220055} \cdot \left(\frac{ABT^{1.5}}{-hb + x4 + ABT \cdot x2 \cdot x4} \right) \cdot \frac{1}{x1} + \frac{0.006}{H100 \cdot + x1^{0.16}} \\
 & \frac{2.38 \cdot ABT}{Cb} \cdot \frac{1}{Cm} \cdot x1 \cdot J0.453 \cdot + 0.4425 \cdot Cb - 0.2862 \cdot Cm + 0.3696 \cdot Cw - \frac{0.003467 \cdot x2}{x4} \\
 & Hx2 + 2 \cdot x4 \cdot x5^2 + 569.2916975592 \cdot ABT^{1.5} \cdot \bar{a} \cdot \frac{-0.566326520612244}{x1 \cdot hb \cdot x4} \\
 & 1x5 \cdot | \cdot | - 2.45175 \cdot \frac{1}{ABT} - 9.807 \cdot hb + 9.807 \cdot x4 + 0.03969110399999999 \cdot x5^2 \cdot \\
 & 3 \cdot \left(13.779184373405185 \cdot + 1 \cdot 1x5 \cdot | \cdot | - 2.45175 \cdot \frac{1}{ABT} - 9.807 \cdot hb + \right. \\
 & \left. 9.807 \cdot x4 + 0.03969110399999999 \cdot x5^2 \cdot \right) \cdot H + \\
 & 10.179775898399999 \cdot 0.93 \cdot + \frac{1}{H1 \cdot - Cp^{0.60247}} \cdot 0.487118 \cdot H1 \cdot + 0.011 \cdot Csternl
 \end{aligned}$$

$$1. \cdot - C_p + \left\{ \begin{array}{l} 0.121563 \\ \text{J} \\ \text{x1} \end{array} \right\} \cdot \left\{ \begin{array}{l} 1.06806 \\ \text{J} \\ \text{x1} \end{array} \right\} \cdot \left\{ \begin{array}{l} 0.36486 \\ \text{J} \\ \text{x1}^2 \\ \text{Cb x2 x4} \end{array} \right\}$$

$$\left\{ \begin{array}{l} 0.46106 \\ \text{J} \\ \text{x1} \end{array} \right\} \cdot \left\{ \begin{array}{l} 2.38 \\ \text{J} \\ \text{Cb} \end{array} \right\} \cdot \left\{ \begin{array}{l} \text{ABT} \\ \text{Cm} \\ \text{x1} \end{array} \right\} \cdot \left\{ \begin{array}{l} 0.453 \\ \text{J} \\ \text{Cb} \end{array} \right\} + 0.4425 \cdot \text{Cb} -$$

$$0.2862 \cdot \text{Cm} + 0.3696 \cdot \text{Cw} - \left\{ \begin{array}{l} 0.003467 \\ \text{H} \\ \text{x4} \end{array} \right\} \cdot \left\{ \begin{array}{l} \text{Hx2} \\ \text{x2} \end{array} \right\} + 2. \cdot \left\{ \begin{array}{l} \text{x4LN} \\ \text{x5}^2 \end{array} \right\}$$

$$\text{H}3.6363748627922092 \cdot \left\{ \begin{array}{l} \text{Log} \\ \text{x1} \\ \text{x5DL}^2 \end{array} \right\} + 0.43429448190325176 \cdot \left\{ \begin{array}{l} \text{Log} \\ \text{x1} \\ \text{x5DL}^2 \end{array} \right\}$$

$$\text{H} - 104.18333333333332 \cdot \text{H} - 0.5226568450555555 \cdot \text{H} + 0.3500246608611111 \cdot \text{CbL} \\ \text{x5} + \\ \text{x1 H} - 5.454166666666667 \cdot \text{H} - 0.0374 \cdot \text{H} - 0.000139213888888889 \cdot \text{Ntd x2} + \\ \text{H}4.998 \cdot \text{H}^{-6} - 0.00004616344444444444 \cdot \text{CbL x2 x3L x5LL}$$

Appendix R

Mathematical Form of the Annual Average Cost

Aac =

$$Ss + H700 \cdot H0.3572 + 0.0187 \cdot x1 H20 + 0.00290000000000000002 \cdot x1 \cdot x2 \cdot x3L \cdot x5L \cdot H104.18333333333332 + H0.5226568450555555 - 0.3500246608611111 \cdot CbL \cdot x5 + x1 H5.454166666666667 + H0.0374 + 0.000139213888888889 \cdot Ntd \cdot x2 + H - 4.998 \cdot \wedge{-6} + 0.00004616344444444444 \cdot CbL \cdot x2 \cdot x3L \cdot x5L +$$

$$1.4 \cdot \frac{10000}{k} + 0.007 \cdot \frac{3937.158241252898}{k} Hx1 \cdot x2 \cdot x3L^{0.5429999999999999} +$$

$$1147.43567662251 \cdot Hx1 \cdot x2 \cdot x3L^{0.6516} + 1340.5493954673384 \cdot Hx1 \cdot x2 \cdot x3L^{0.724} +$$

$$22.82190868118506 \cdot H1 + 0.49532 \cdot CbL \cdot \frac{1}{k} + 0.000928 \cdot J - 8.3 + \frac{x1^{1.691}}{x3} \cdot \frac{1}{k} Hx1 \cdot x2 \cdot x3L^{1.003} + 15.615836543400706 \cdot$$

$$\frac{1}{k} H1 + 0.49532 \cdot CbL \cdot \frac{1}{k} + 0.000928 \cdot J - 8.3 + \frac{x1^{1.691}}{x3} \cdot Hx1 \cdot x2 \cdot x3L^{1.003} \cdot 0.85 +$$

$$81.3442803654393 \cdot x5 \cdot \frac{1}{k} \cdot \frac{1}{k} \cdot 2.2366662295036503 \cdot \wedge{10} c7^{3.78613} \cdot Cb$$

$$\bar{a} \cdot \frac{1}{k} - 1.41434649220055 \cdot \frac{ABT^{1.5}}{-hb + x4 + ABT \cdot x2 \cdot x4} + \frac{1}{k} \cdot \frac{1}{x1^{0.9}}$$

$$\frac{1}{k} \cdot 5.081833302662383 \cdot \frac{1}{k} - c16 - \frac{4.79323 \cdot x2}{x1} + \frac{0.0140407 \cdot x1}{x4} -$$

$$\frac{1.75254 \cdot Cb \cdot x2 \cdot x4}{H Cb \cdot x1 \cdot x2 \cdot x4L^{0.6666666666666667}} \cdot \frac{1}{k} + 0 \cdot \bar{a} \cdot \frac{1}{k} \cdot \frac{1}{x1^{0.29}}$$

$$\cos B \cdot \frac{-13.34248601399447 + 53.59231882287779 \cdot Cb}{1 \cdot x1} \cdot x1$$

$$x2 \cdot J1 - \frac{0.8 \cdot AT}{Cm \cdot x2 \cdot x4} \cdot x4 \cdot \frac{1.07961}{x2} + 135.730345312 \cdot AT \cdot c6 \cdot x5^{2.2} +$$

$$135.730345312 \cdot \frac{1}{k} - 0.00205 - 0.0010954451150103322 \cdot H - 0.04 + 1 \cdot c4L$$

$$Cb^4 \cdot \bar{a}^{-1.41434649220055} \cdot \frac{ABT^{1.5}}{-hb+x4+ABT \cdot x2 \cdot x4} \cdot \frac{1}{x1} + \frac{0.006}{H100 + x1L^{0.16}} \cdot \frac{1}{k}$$

$$\frac{2.38 \cdot ABT}{Cb} + \frac{1}{Cm} \cdot x1 \cdot J0.453 + 0.4425 \cdot Cb - 0.2862 \cdot Cm + 0.3696 \cdot Cw -$$

$$\begin{aligned}
& \bar{a}^k - 1.41434649220055 \cdot \frac{ABT^{1.5}}{-hb + x^4 + ABT^2 x^4} + \frac{1}{x^1} \\
& \int_k \left[5.081833302662383 \int_k -c16 - \frac{4.79323 \cdot x^2}{x^1} + \frac{0.0140407 \cdot x^1}{x^4} - \right. \\
& \quad \left. \frac{1.75254 \cdot Cb \cdot x^2 \cdot x^4}{HCb \cdot x^1 \cdot x^2 \cdot x^4} + 0. \bar{a} \right] \\
& \text{CosB} = \frac{-13.34248601399447 + 53.59231882287779 \cdot C_p}{x^1} \\
& x^2 J_1 - \frac{0.8 \cdot AT}{C_m \cdot x^2 \cdot x^4} + \frac{x^4}{x^2} + 135.730345312 \cdot AT \cdot c_6 \cdot x^5 \cdot x^2 + \\
& 135.730345312 \cdot -0.00205 - 0.0010954451150103322 \cdot H - 0.04 + 1 \cdot c_4 L \\
& C_b^4 \cdot \bar{a}^{-1.41434649220055} \cdot \frac{ABT^{1.5}}{-hb+x^4+ABT^2 x^4} \cdot \frac{1}{x^1} + \frac{0.006}{H100. + x^{1L^{0.16}}} \\
& \frac{2.38 \cdot ABT}{C_b} + C_m \cdot x^1 J_{0.453} + 0.4425 \cdot C_b - 0.2862 \cdot C_m + \\
& 0.3696 \cdot C_w - \frac{0.003467 \cdot x^2}{x^4} \\
& 569.2916975592 \cdot ABT^{1.5} \cdot \bar{a} \cdot \frac{1}{x^5} \cdot | -2.45175 \cdot \frac{1}{ABT} - \\
& 9.807 \cdot hb + 9.807 \cdot x^4 + 0.03969110399999999 \cdot x^5 \cdot \text{MM}^3 \\
& 13.779184373405185 + 1 \cdot |x^5 \cdot | -2.45175 \cdot \frac{1}{ABT} - 9.807 \cdot hb + \\
& 9.807 \cdot x^4 + 0.03969110399999999 \cdot x^5 \cdot \text{MM}^2 \cdot \text{M} + \\
& 10.179775898399999 \int_k 0.93 + \frac{1}{H1. - Cpl} \int_k 0.487118 \cdot H1. + 0.011 \cdot Csternl \\
& \int_k 1. - Cp + \frac{1}{-1. + 4. Cp} \int_k 0.121563 \cdot \frac{x^2}{x^1} + 1.06806 \cdot \int_k \frac{x^1 \cdot x^2}{Cb \cdot x^2 \cdot x^4} + 0.36486 \\
& \int_k \frac{x^4}{x^1} + 0.46106 \cdot \frac{2.38 \cdot ABT}{Cb} + C_m \cdot x^1 J_{0.453} + 0.4425 \cdot C_b - \\
& 0.2862 \cdot C_m + 0.3696 \cdot C_w - \frac{0.003467 \cdot x^2}{x^4}
\end{aligned}$$

$$0.6363748627922092 + 0.43429448190325176 \log(x^1 x^5)^{2.2} + 0.2 +$$

$$751.5897375985036 \sqrt[1]{x^1 x^2 x^3}^{0.5429999999999999} +$$

$$0.29143753090741126 \sqrt[1]{x^1 x^2 x^3}^{0.6516} +$$

$$0.2203148213921238 \sqrt[1]{x^1 x^2 x^3}^{0.724} +$$

$$0.003750704563310625 \sqrt[1]{x^1 x^2 x^3}^{1.003} +$$

$$1.7240374574294893^{-6} Cb$$

$$\sqrt[1]{1077.586206896552} +$$

$$1. \sqrt[1]{J - 8.3} + \sqrt[1]{\frac{x^1}{x^3}}^{1.691}$$

$$\sqrt[1]{x^1 x^2 x^3}^{1.003} + 3.48065383475226^{-6}$$

$$\sqrt[1]{J - 8.3} + \sqrt[1]{\frac{x^1}{x^3}}^{1.691}$$

$$\sqrt[1]{x^1 x^2 x^3}^{1.003} +$$

$$0.003966270997132027$$

$$\sqrt[1]{1.} + 0.49532 Cb \sqrt[1]{1.} + 0.000928 \sqrt[1]{J - 8.3} + \sqrt[1]{\frac{x^1}{x^3}}^{1.691}$$

$$\sqrt[1]{x^1 x^2 x^3}^{1.003} \sqrt[1]{0.85} +$$

$$30.47265682723607 \sqrt[1]{2.2604108721379874 \sqrt[1]{x^1 x^2 x^3}^{0.1666666666666666}} +$$

$$0.5373968269457794 \sqrt[1]{x^5} - \sqrt[1]{Cm \sqrt[1]{90.} - \sqrt[1]{hal}^{1.37565}}$$

$$\sqrt[1]{1.78933298360292 \cdot 10^7}^{3.78613} Cb \sqrt[1]{a} - 1.41434649220055$$

$$\& \sqrt[1]{-hb + x^4 + \frac{ABT^{1.5}}{ABT \cdot x^2 \cdot x^4}} - \frac{5.081833302662383 \cdot c^{16}}{\sqrt[1]{x^1}}$$

$$\frac{24.358395841320416 \cdot x^2}{\sqrt[1]{x^1}} + \frac{0.07135249685269171 \cdot x^1}{\sqrt[1]{x^1}}$$

$$\begin{aligned}
& 8.906116136247933 \cdot Cb \cdot x^2 \cdot x^4 + 0. \cdot \bar{a} \\
& H Cb \cdot x^1 \cdot x^2 \cdot x^4 L^{0.666666666666667} \cdot \frac{1}{x^1} \\
& \text{CosB} \frac{-13.34248601399447 + 53.59231882287779 \cdot Cb}{x^1} x^1 \\
& J \frac{x^4}{x^2} \cdot 1.07961 \cdot H1. \cdot AT - 1.25 \cdot Cm \cdot x^2 \cdot x^4 L^{1.9} + 135.730345312 \cdot AT \\
& c6 \cdot x^5 \cdot x^2 + 135.730345312 \cdot -0.00205 \cdot -0.0010954451150103322 \cdot \\
& H - 0.04 + 1. \cdot c4L \cdot Cb^4 \cdot \bar{a}^{-1.41434649220055} \cdot \frac{ABT^{1.5}}{-hb+x^4 \cdot ABT \cdot x^2 \cdot x^4} \cdot \frac{1}{x^1} + \\
& H100. \cdot + x1L^{0.16} \cdot J \frac{2.38 \cdot ABT}{Cb} + \cdot \frac{1}{Cm} \cdot x1 \cdot J0.453 \cdot + 0.4425 \cdot Cb - \\
& 0.2862 \cdot Cm + 0.3696 \cdot Cw - \frac{0.003467 \cdot x^2}{x^4} \cdot Hx2 + 2. \cdot x4LN \\
& x5^2 \cdot + 569.2916975592 \cdot ABT^{1.5} \cdot \bar{a}^{-0.666666666666667} \cdot \frac{1}{-1.5 \cdot hb \cdot x^4} \\
& lx5 \cdot l' \cdot l - 2.45175 \cdot \cdot \frac{1}{ABT} - 9.807 \cdot hb + 9.807 \cdot x4 + \\
& 0.03969110399999999 \cdot x5^2 \cdot \frac{1}{M^3} \cdot " \\
& 13.779184373405185 + 1. \cdot lx5 \cdot l' \cdot l - 2.45175 \cdot \cdot \frac{1}{ABT} - 9.807 \cdot hb + \\
& 9.807 \cdot x4 + 0.03969110399999999 \cdot x5^2 \cdot \frac{1}{M^2} \cdot M + \\
& 10.179775898399999 \cdot 0.93 + \frac{1}{H1.} \cdot - Cpl^{0.60247} \cdot 0.487118 \cdot \\
& H1. \cdot + 0.011 \cdot CsternL \cdot \frac{1. \cdot - Cp + \frac{0.121563}{-1. \cdot +4. \cdot Cp}}{x^1} \\
& J \frac{x^2}{x^1} \cdot 1.06806 \cdot J \frac{x^1 \cdot x^2}{Cb \cdot x^2 \cdot x^4} \cdot 0.36486 \cdot J \frac{x^4}{x^1} \cdot 0.46106 \cdot \frac{1}{x^1} \\
& J \frac{2.38 \cdot ABT}{Cb} + \cdot \frac{1}{Cm} \cdot x1 \cdot J0.453 \cdot + 0.4425 \cdot Cb - 0.2862 \cdot Cm + \\
& 0.3696 \cdot Cw - \frac{0.003467 \cdot x^2}{x^4} \cdot Hx2 + 2. \cdot x4LN \cdot x5^2 \cdot " \\
& H3.6363748627922092 \cdot + 0.43429448190325176 \cdot \text{Log} @ x1 \cdot x5L^2 \cdot \frac{1}{x^1} \cdot \frac{1}{x^1}
\end{aligned}$$

$$0.2^{0.56} + 0.015253338360763261$$

$$x5 - \text{Cm} \text{H}90 - \text{hal}^{1.37565} \cdot 1.78933298360292 \cdot 10^7 \cdot c^{3.78613} \cdot \text{Cb} \bar{a} - 1.41434649220055$$

$$\& \cdot \frac{\text{ABT}^{1.5}}{-hb + x4 + \text{ABT} x2 x4} - \frac{5.081833302662383 \cdot c^{16}}{x1^{0.9}}$$

$$\frac{24.358395841320416 \cdot x2}{x1^{0.9}} + \frac{0.07135249685269171 \cdot x1}{x4 \cdot x1^{0.9}}$$

$$\frac{8.906116136247933 \cdot \text{Cb} x2 x4}{\text{HCb} x1 x2 x4^{0.666666666666667} \cdot x1^{0.9}} + 0. \bar{a} - \frac{43.953161110895605}{x1^{0.9}}$$

$$\text{CosB} \frac{-13.34248601399447 + 53.59231882287779 \cdot \text{Cp}}{x1} \cdot x1$$

$$\frac{x4^{1.07961}}{x2} \cdot \text{H}1 \cdot \text{AT} - 1.25 \cdot \text{Cm} x2 x4 + 135.730345312 \cdot \text{AT} c6 x5^2 +$$

$$135.730345312 - 0.00205 - 0.0010954451150103322 \cdot \text{H} - 0.04 + 1 \cdot c4$$

$$\text{Cb}^4 \cdot \bar{a}^{-1.41434649220055} \cdot \frac{\text{ABT}^{1.5}}{-hb+x4+ \text{ABT} x2 x4} \cdot \frac{0.006}{\text{H}100 + x1^{1.16}}$$

$$\frac{2.38 \cdot \text{ABT}}{\text{Cb}} + \text{Cm} x1 \text{J}0.453 + 0.4425 \cdot \text{Cb} - 0.2862 \cdot \text{Cm} +$$

$$0.3696 \cdot \text{Cw} - \frac{0.003467 \cdot x2}{x4} \cdot \text{H}x2 + 2 \cdot x4 \text{LN} x5^2 +$$

$$569.2916975592 \cdot \text{ABT}^{1.5} \cdot \bar{a}^{-1.37565} \cdot \frac{\text{ABT}^{1.5}}{-hb+x4+ \text{ABT} x2 x4} \cdot \text{I}x5 \cdot \text{I} - 2.45175 \cdot \text{ABT} -$$

$$9.807 \cdot \text{hb} + 9.807 \cdot x4 + 0.03969110399999999 \cdot x5^2 \cdot \text{I}^3$$

$$13.779184373405185 + 1 \cdot \text{I}x5 \cdot \text{I} - 2.45175 \cdot \text{ABT} - 9.807 \cdot \text{hb} +$$

$$9.807 \cdot x4 + 0.03969110399999999 \cdot x5^2 \cdot \text{I}^2$$

$$\frac{10.179775898399999}{x1} \cdot 0.93 + \frac{\text{H}1 \cdot \text{Cpl}^{0.60247}}{x1} \cdot 0.487118 \cdot \text{H}1 + 0.011 \cdot \text{Csternl}$$

$$\begin{aligned}
& 1. \cdot - C_p + \left\{ \begin{array}{l} 0.121563 \\ \text{J} \end{array} \right\} \frac{x^2}{x^1} \cdot 1.06806 \cdot \left\{ \begin{array}{l} x^1 \\ \text{Cb} \end{array} \right\} \frac{x^2}{x^4} \cdot 0.36486 \\
& \left\{ \begin{array}{l} x^4 \\ \text{J} \end{array} \right\} \cdot 0.46106 \cdot \left\{ \begin{array}{l} x^4 \\ \text{J} \end{array} \right\} \cdot \frac{2.38 \cdot \text{ABT}}{\text{Cb}} + \left\{ \begin{array}{l} \text{Cm} \\ \text{Cm} \end{array} \right\} \cdot x^1 \cdot \text{J} \cdot 0.453 \cdot + 0.4425 \cdot \text{Cb} - \\
& 0.2862 \cdot \text{Cm} + 0.3696 \cdot \text{Cw} - \frac{0.003467 \cdot x^2}{x^4} \cdot \text{Hx}^2 + 2. \cdot x^4 \cdot \text{LN} \cdot x^5 \cdot 2. \cdot \\
& \text{H}3.6363748627922092 \cdot + 0.43429448190325176 \cdot \text{Log} \cdot x^1 \cdot x^5 \cdot \text{DL} \cdot 2. \cdot \wedge 0.6 \cdot + \\
& 11.595927506702413 \cdot \text{H} - 0.3572 \cdot - 0.0187 \cdot x^1 \cdot x^5 \cdot \left\{ \begin{array}{l} \text{H}90. \cdot - \text{hal} \end{array} \right\} \cdot 1.37565 \\
& 2.2366662295036503 \cdot \wedge 10 \cdot c7^{3.78613} \cdot \text{Cb} \\
& \bar{a} \wedge - 1.41434649220055 \cdot \& \left\{ \begin{array}{l} \text{ABT}^{1.5} \\ - \text{hb} + x^4 + \text{ABT} \end{array} \right\} \cdot \frac{x^2}{x^4} + \\
& \left\{ \begin{array}{l} x^1 \\ \text{J} \end{array} \right\} \cdot 5.081833302662383 \cdot \left\{ \begin{array}{l} x^1 \\ \text{J} \end{array} \right\} - c16 - \frac{4.79323 \cdot x^2}{x^1} + \\
& \frac{0.0140407 \cdot x^1}{x^4} - \frac{1.75254 \cdot \text{Cb} \cdot x^2 \cdot x^4}{\text{HCb} \cdot x^1 \cdot x^2 \cdot x^4} \cdot \left\{ \begin{array}{l} \text{W} \\ \text{H} \end{array} \right\} \cdot 0.6666666666666667 \\
& 0. \cdot \bar{a} \cdot \left\{ \begin{array}{l} x^1 \\ \text{J} \end{array} \right\} \cdot \text{CosB} \cdot \frac{-13.34248601399447 \cdot + 53.59231882287779 \cdot \text{Cp}}{\text{I} \cdot \text{XT}} \\
& x^1 \cdot x^2 \cdot \text{J} \cdot 1. \cdot - \frac{0.8 \cdot \text{AT}}{\text{Cm} \cdot x^2 \cdot x^4} \cdot x^4 \cdot \left\{ \begin{array}{l} x^4 \\ \text{J} \end{array} \right\} \cdot 1.07961 \cdot \left\{ \begin{array}{l} \text{V} \\ \text{I} \end{array} \right\} + 135.730345312 \cdot \text{AT} \cdot c6 \cdot x^5 \cdot 2. \cdot + \\
& 135.730345312 \cdot - 0.00205 \cdot - 0.0010954451150103322 \cdot \text{H} - 0.04 \cdot + 1. \cdot c4 \cdot \text{L} \\
& \text{Cb}^4 \cdot \bar{a} \cdot - 1.41434649220055 \cdot \left\{ \begin{array}{l} \text{ABT}^{1.5} \\ - \text{hb} + x^4 + \text{ABT} \end{array} \right\} \cdot \frac{x^2}{x^4} + \left\{ \begin{array}{l} \text{H}100. \cdot + x^1 \end{array} \right\} \cdot 0.006 \cdot \wedge 0.16 \\
& \left\{ \begin{array}{l} x^4 \\ \text{J} \end{array} \right\} \cdot \frac{2.38 \cdot \text{ABT}}{\text{Cb}} + \left\{ \begin{array}{l} \text{Cm} \\ \text{Cm} \end{array} \right\} \cdot x^1 \cdot \text{J} \cdot 0.453 \cdot + 0.4425 \cdot \text{Cb} - 0.2862 \cdot \text{Cm} + \\
& 0.3696 \cdot \text{Cw} - \frac{0.003467 \cdot x^2}{x^4} \cdot \text{Hx}^2 + 2. \cdot x^4 \cdot \text{LN} \cdot x^5 \cdot 2. \cdot +
\end{aligned}$$

$$569.2916975592 \text{ ABT}^{1.5} \bar{a} \left\{ \frac{1}{x^5} \left(1 - 2.45175 \cdot \text{ABT} \right) \right\}$$

$$9.807 \text{ hb} + 9.807 x^4 + 0.03969110399999999 x^5 \cdot \text{ABT}^3$$

$$13.779184373405185 + 1 \cdot \frac{1}{x^5} \left(1 - 2.45175 \cdot \text{ABT} \right) - 9.807 \text{ hb} + 9.807 x^4 + 0.03969110399999999 x^5 \cdot \text{ABT}^2$$

$$10.179775898399999 \left\{ 0.93 + \frac{1}{\text{H}1} - \text{Cpl}^{0.60247} \right\} + 0.487118 \text{ H}1 + 0.011 \text{ Csternl}$$

$$1 - \text{Cp} + \frac{0.121563}{-1.74 \cdot \text{Cp}}$$

$$\frac{1.06806}{x^2} \cdot \frac{1}{x^2} \cdot \frac{0.36486}{\text{Cb} x^2 x^4} + \frac{0.46106}{x^4} \cdot \frac{1}{x^1}$$

$$\frac{2.38 \text{ ABT}}{\text{Cb}} + \text{Cm} x^1 \cdot 0.453 + 0.4425 \text{ Cb} - 0.2862 \text{ Cm} + 0.3696$$

$$\text{Cw} - \frac{0.003467 x^2}{x^4} \text{ Hx}^2 + 2 \cdot x^4 \text{ LN} x^5$$

$$\text{H}3.6363748627922092 + 0.43429448190325176 \text{ Log} x^1 x^5 \text{ DL}^2$$

$$\text{H} - 104.1833333333332 + \text{H} - 0.5226568450555555 + 0.3500246608611111 \text{ Cbl} x^5 + x^1$$

$$\text{H} - 5.454166666666667 + \text{H} - 0.0374 - 0.0001392138888888889 \text{ Ntd} x^2 + \text{H}4.998 \cdot x^{-6} - 0.00004616344444444444 \text{ Cbl} x^2 x^3 \text{ L} x^5 \text{ L}$$