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Ubicumque homo est,
ibi beneficilous est

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(2)

$$\frac{d^2}{ds^2}\frac{\partial F}{\partial w''} = \frac{w''}{w''^2} - \frac{2[w'+(1-\mu)\alpha-\nu\frac{f}{l}]w'''}{w''^3} - \frac{2w^{IV}[w+\varrho l\alpha+\vartheta f+(1-\mu)\alpha s-\nu\frac{f}{l}L]}{w''^3} -$$

$$-\frac{2w'''[w'+(1-\mu)\alpha-\nu\frac{f}{l}]}{w''^3} + \frac{6w'''^2[w+\varrho l\alpha+\vartheta f+(1-\mu)\alpha s-\nu\frac{f}{l}s]}{w''^4}$$

$$\frac{d^2}{ds^2}\frac{\partial F}{\partial w''} = \frac{1}{w''} - \frac{4w'''[w'+(1-\mu)\alpha-\nu\frac{f}{l}]}{w''^3} + \frac{(6w'''^2-2w''w^{IV})[w+\varrho l\alpha+\vartheta f+(1-\mu)\alpha s-\frac{\nu f}{l}s]}{w''^5}$$

E.L. $-2w''w'''[w'+(1-\mu)\alpha-\nu\frac{f}{l}] + (3w'''^2-w''w^{IV})[w+\varrho l\alpha+\vartheta f+(1-\mu)\alpha s-\frac{\nu f}{l}s]=0$

$$\boxed{(w''w^{IV}-3w'''^2)[w+\varrho l\alpha+\vartheta f \ldots -\nu\frac{f}{l}s] + 2w''w'''[w'+(1-\mu)\alpha-\nu\frac{f}{l}]=0}$$

$$EI(s)(w_5''+\tfrac{1}{2}w_3''w_1'^2+\tfrac{3}{8}w_1''w_1'^4+w_1''w_1'w_3') + P_{cr}w_5 + (P_2+P_{cr}V_2+C_{v_2})w_3 +$$
$$+ (P_4+P_2V_2+P_{cr}V_4+C_{v_4})w_1 + (P_4M_1+P_2M_3+P_{cr}M_5+C_{m_5}) +$$
$$+ (P_4H_1+P_2H_3+P_{cr}H_5+C_{h_5})s + (P_2H_1+P_{cr}H_3+C_{h_3})\left(-\tfrac{1}{2}\int_0^s w_1'^2 \ldots\right) +$$
$$+ (P_{cr}H_1+C_{h_1})\left[-\int_0^s w_1'w_3'(\bar s)d\bar s - \tfrac{1}{8}\int_0^s w_1'^4(\bar s)d\bar s\right]=0$$

transv. p° α

$$-\frac{\partial F}{\partial w''}\Big|_0^l + \int_0^l \frac{\partial F}{\partial \alpha}ds = 0$$

$$-\frac{\varrho l\alpha+\vartheta f}{[w''(0)]^2} \ldots \int_0^l \varrho l + \ldots$$

$$\int_0^l \frac{1}{w''}ds = \int_0^l \frac{d^2}{ds^2}\frac{w+\varrho l\alpha+\vartheta f+(1-\mu)\alpha s-\nu\ldots}{w''^2}ds - ds$$

$$= \frac{(1-\mu)\alpha-\nu\frac{f}{l}}{\ldots} - \frac{2w'''(l)[(1+\vartheta)f+\varrho l\alpha+(1-\mu)\alpha l-\nu f]}{\ldots} - \frac{(2-\mu)\alpha-\nu\frac{f}{l}}{\ldots} \ldots$$

$$+\frac{2\varrho l w'''(0)(\varrho l\alpha+\vartheta f)}{[w''(0)]^3}\nu - \frac{(1-\mu)^2\alpha l-(1-\mu)\nu f}{[w''(l)]^2}\nu + \frac{2(1-\mu)l\,w'''(l)[(1+\vartheta)f+\varrho l\alpha+(1-\mu)\alpha l-\nu f]}{[w''(l)]^3} +$$

$$+\frac{(1-\mu)[(1+\vartheta)f+\varrho l\alpha+(1-\mu)\alpha l-\nu f)]}{[w''(l)]^2}\nu - \frac{(1-\mu)(\varrho l\alpha+\vartheta f)}{[w''(0)]^2}\nu = 0$$

(30) $EI(s)(w_1''\varepsilon+w_2''\varepsilon^2+\ldots)(1+\tfrac{1}{2}w_1'^2\varepsilon^2+\ldots)+[P_{cr}+(P_1+P_{cr}V_1+C_{v_1})\varepsilon+\ldots](w_1\varepsilon+$

$+w_2\varepsilon^2+\ldots)+(P_{cr}M_1+C_{m_1})\varepsilon+[P_1M_1+P_{cr}\bar M_2+C\bar m_2+$

$+(P_{cr}M_{100}+C_{m_{100}})f_2+(P_{cr}M_{010}+C_{m_{010}})\alpha_2]\varepsilon^2+\ldots$

$+\{(P_{cr}H_1+C_{h_1})\varepsilon+[P_1H_1+P_{cr}\bar H_2+C\bar h_2+(P_{cr}H_{100}+C_{h_{100}})f_2+$

$+(P_{cr}H_{010}+C_{h_{010}})\alpha_2]\varepsilon^2+\ldots\}[s-\frac{\varepsilon^2}{2}\int_0^s w_1'^2(\bar s)d\bar s+\ldots]=0$

(31) $EI(s)(w_1''\varepsilon+w_3''\varepsilon^3+\ldots)(1+\tfrac{1}{2}w_1'^2\varepsilon^2+\ldots)+[P_{cr}+(P_2+P_{cr}V_2+C_{v_2})\varepsilon^2+\ldots]($

$(w_1\varepsilon+w_3\varepsilon^3+\ldots)+(P_{cr}M_1+C_{m_1})\varepsilon+[P_2M_1+P_{cr}\bar M_3+C\bar m_3+$

$+(P_{cr}M_{100}+Cm_{100})f_3+(P_{cr}M_{010}+C_{m_{010}})\alpha_3]\varepsilon^3+\ldots$

$\ldots H_1+C_{h_1})\varepsilon+[P_2H_1+P_{cr}\bar H_3+C\bar h_3+(P \ldots$

$$-\frac{2w'''[w'+(1-\mu)\alpha-\nu\frac{f}{l}]}{w''^3} + \frac{6w'''^2[w+\varrho l\alpha+\vartheta f+(1-\mu)\alpha s-\frac{\nu f}{l}s]}{w''^4}$$

$$\ldots \frac{\partial F}{\ldots} = \frac{1}{w''} - \frac{4w'''[w'+(1-\mu)\alpha-\nu\frac{f}{l}]}{w''^3} + \frac{(6w'''^2-2w''w^{IV})[w+\varrho l\alpha+\vartheta f+(1-\mu)\alpha s-\frac{\nu f}{l}s]}{w''^5}=0$$

$\ldots(1-\mu)\alpha-\nu\frac{f}{l}) + (3w'''^2-w''w^{IV})[w+\varrho l\alpha+\vartheta f+(1-\mu)\alpha s-\frac{\nu f}{l}s] + 2w''w'''[w'+(1-\mu)\alpha-\nu\frac{f}{l}]=0$

$C_1 = C_2\,tgkl + \frac{\ldots}{k\cos kl}(H_1+\frac{\ldots}{P_{cr}}h_1)$

$\int w_1'w_1'w_1''w_3'ds = \tfrac{1}{2}w_1'^2w_1w_3'\Big|_0^l - \int_0^l \tfrac{1}{2}w_1'^2(w_1'w_3'+w_1w_3'')ds$

$$(M_1+\frac{C}{P_{cr}}m_1)k\,tgkl + \frac{1}{\cos kl}(H_1+\frac{C}{P_{cr}}h_1) - (H_1+\frac{C}{P_{cr}}h_1) = \alpha_1$$