

eqss[10] /. Sol1 /. Sol2

$$\begin{aligned}
& (\sin[\Theta_1[t]] - \sin[\Theta_2[t]]) c_f + (-\sin[\gamma_1[t] - \phi_1[t]] + \sin[\gamma_2[t] - \phi_2[t]]) m_f + \\
& \sin[\gamma_2[t]] p_f + x_{p_2}[t] + \cos[\Psi[t]] \cos[a_1[t]] \\
& (-\cos[\Psi[t]]^2 \sec[a_1[t]] l_f - \sec[a_1[t]] \sin[\Psi[t]]^2 l_f - \cos[\Psi[t]]^2 \sec[a_1[t]] l_r - \\
& \sec[a_1[t]] \sin[\Psi[t]]^2 l_r + \cos[\gamma_1[t] - \phi_1[t]] \sec[a_1[t]] \sin[\Psi[t]] m_f + \\
& \cos[\Psi[t]] \sec[a_1[t]] \sin[\gamma_1[t] - \phi_1[t]] m_f - \cos[\gamma_3[t] - \phi_3[t]] \\
& \sec[a_1[t]] \sin[\Psi[t]] m_r - \cos[\Psi[t]] \sec[a_1[t]] \sin[\gamma_3[t] - \phi_3[t]] m_r + \\
& \cos[\gamma_1[t]] \sec[a_1[t]] \sin[\Psi[t]] p_f + \cos[\Psi[t]] \sec[a_1[t]] \sin[\gamma_1[t]] p_f - \\
& \cos[\gamma_3[t]] \sec[a_1[t]] \sin[\Psi[t]] p_r - \cos[\Psi[t]] \sec[a_1[t]] \sin[\gamma_3[t]] p_r - \\
& \cos[\Psi[t]]^2 \cot[b_1[t]] h_f \tan[a_1[t]] - \cot[b_1[t]] \sin[\Psi[t]]^2 h_f \tan[a_1[t]] + \\
& \cos[\Psi[t]]^2 \cot[b_1[t]] h_r \tan[a_1[t]] + \cot[b_1[t]] \sin[\Psi[t]]^2 h_r \tan[a_1[t]] + \\
& \cos[\Psi[t]] \cos[\gamma_1[t] - \phi_1[t]] \cot[b_1[t]] m_f \tan[a_1[t]] - \\
& \cot[b_1[t]] \sin[\Psi[t]] \sin[\gamma_1[t] - \phi_1[t]] m_f \tan[a_1[t]] - \\
& \cos[\Psi[t]] \cos[\gamma_3[t] - \phi_3[t]] \cot[b_1[t]] m_r \tan[a_1[t]] + \\
& \cot[b_1[t]] \sin[\Psi[t]] \sin[\gamma_3[t] - \phi_3[t]] m_r \tan[a_1[t]] + \\
& \cos[\Psi[t]] \cos[\gamma_1[t]] \cot[b_1[t]] p_f \tan[a_1[t]] - \\
& \cot[b_1[t]] \sin[\Psi[t]] \sin[\gamma_1[t]] p_f \tan[a_1[t]] - \cos[\Psi[t]] \cos[\gamma_3[t]] \\
& \cot[b_1[t]] p_r \tan[a_1[t]] + \cot[b_1[t]] \sin[\Psi[t]] \sin[\gamma_3[t]] p_r \tan[a_1[t]] + \\
& c_f (\sec[a_1[t]] \sin[\Psi[t] - \Theta_1[t]] + \cos[\Psi[t] - \Theta_1[t]] \cot[b_1[t]] \tan[a_1[t]]) - \\
& c_r (\sec[a_1[t]] \sin[\Psi[t] - \Theta_3[t]] + \cos[\Psi[t] - \Theta_3[t]] \cot[b_1[t]] \tan[a_1[t]]) + \\
& \cos[\Psi[t]] \sec[a_1[t]] x_{p_1}[t] - \cot[b_1[t]] \sin[\Psi[t]] \tan[a_1[t]] x_{p_1}[t] - \\
& \cos[\Psi[t]] \sec[a_1[t]] x_{p_3}[t] + \cot[b_1[t]] \sin[\Psi[t]] \tan[a_1[t]] x_{p_3}[t] + \\
& \sec[a_1[t]] \sin[\Psi[t]] z_{p_1}[t] + \cos[\Psi[t]] \cot[b_1[t]] \tan[a_1[t]] z_{p_1}[t] - \\
& (\sec[a_1[t]] \sin[\Psi[t]] + \cos[\Psi[t]] \cot[b_1[t]] \tan[a_1[t]]) z_{p_3}[t] + \\
& \csc[b_2[t]] (\cos[\Psi[t]] \cos[b_2[t]] \sin[a_2[t]] + \sin[\Psi[t]] \sin[b_2[t]]) \\
& (\cos[\Psi[t] - \Theta_2[t]] c_f - \cos[\Psi[t] - \Theta_4[t]] c_r - h_f + h_r + \cos[\Psi[t] + \gamma_2[t] - \phi_2[t]] m_f - \\
& \cos[\Psi[t] + \gamma_4[t] - \phi_4[t]] m_r + \cos[\Psi[t] + \gamma_2[t]] p_f - \cos[\Psi[t] + \gamma_4[t]] p_r + \\
& \sin[\Psi[t]] (-x_{p_2}[t] + x_{p_4}[t]) + \cos[\Psi[t]] (z_{p_2}[t] - z_{p_4}[t])) = \sin[\gamma_1[t]] p_f + \\
& x_{p_1}[t] + \csc[b_1[t]] (\cos[\Psi[t]] \cos[b_1[t]] \sin[a_1[t]] + \sin[\Psi[t]] \sin[b_1[t]]) \\
& (\cos[\Psi[t] - \Theta_1[t]] c_f - \cos[\Psi[t] - \Theta_3[t]] c_r - h_f + h_r + \cos[\Psi[t] + \gamma_1[t] - \phi_1[t]] m_f - \\
& \cos[\Psi[t] + \gamma_3[t] - \phi_3[t]] m_r + \cos[\Psi[t] + \gamma_1[t]] p_f - \cos[\Psi[t] + \gamma_3[t]] p_r + \\
& \sin[\Psi[t]] (-x_{p_1}[t] + x_{p_3}[t]) + \cos[\Psi[t]] (z_{p_1}[t] - z_{p_3}[t])) + \cos[\Psi[t]] \cos[a_2[t]] \\
& (-\cos[\Psi[t]]^2 \sec[a_2[t]] l_f - \sec[a_2[t]] \sin[\Psi[t]]^2 l_f - \cos[\Psi[t]]^2 \sec[a_2[t]] l_r - \\
& \sec[a_2[t]] \sin[\Psi[t]]^2 l_r + \cos[\gamma_2[t] - \phi_2[t]] \sec[a_2[t]] \sin[\Psi[t]] m_f + \\
& \cos[\Psi[t]] \sec[a_2[t]] \sin[\gamma_2[t] - \phi_2[t]] m_f - \cos[\gamma_4[t] - \phi_4[t]] \\
& \sec[a_2[t]] \sin[\Psi[t]] m_r - \cos[\Psi[t]] \sec[a_2[t]] \sin[\gamma_4[t] - \phi_4[t]] m_r + \\
& \cos[\gamma_2[t]] \sec[a_2[t]] \sin[\Psi[t]] p_f + \cos[\Psi[t]] \sec[a_2[t]] \sin[\gamma_2[t]] p_f - \\
& \cos[\gamma_4[t]] \sec[a_2[t]] \sin[\Psi[t]] p_r - \cos[\Psi[t]] \sec[a_2[t]] \sin[\gamma_4[t]] p_r - \\
& \cos[\Psi[t]]^2 \cot[b_2[t]] h_f \tan[a_2[t]] - \cot[b_2[t]] \sin[\Psi[t]]^2 h_f \tan[a_2[t]] + \\
& \cos[\Psi[t]]^2 \cot[b_2[t]] h_r \tan[a_2[t]] + \cot[b_2[t]] \sin[\Psi[t]]^2 h_r \tan[a_2[t]] + \\
& \cos[\Psi[t]] \cos[\gamma_2[t] - \phi_2[t]] \cot[b_2[t]] m_f \tan[a_2[t]] - \\
& \cot[b_2[t]] \sin[\Psi[t]] \sin[\gamma_2[t] - \phi_2[t]] m_f \tan[a_2[t]] - \\
& \cos[\Psi[t]] \cos[\gamma_4[t] - \phi_4[t]] \cot[b_2[t]] m_r \tan[a_2[t]] + \\
& \cot[b_2[t]] \sin[\Psi[t]] \sin[\gamma_4[t] - \phi_4[t]] m_r \tan[a_2[t]] + \\
& \cos[\Psi[t]] \cos[\gamma_2[t]] \cot[b_2[t]] p_f \tan[a_2[t]] - \\
& \cot[b_2[t]] \sin[\Psi[t]] \sin[\gamma_2[t]] p_f \tan[a_2[t]] - \cos[\Psi[t]] \cos[\gamma_4[t]]
\end{aligned}$$

$$\begin{aligned}
& \cot[b_2[t]] p_r \tan[a_2[t]] + \cot[b_2[t]] \sin[\Psi[t]] \sin[\gamma_4[t]] p_r \tan[a_2[t]] + \\
& c_f (\sec[a_2[t]] \sin[\Psi[t] - \theta_2[t]] + \cos[\Psi[t] - \theta_2[t]] \cot[b_2[t]] \tan[a_2[t]]) - \\
& c_r (\sec[a_2[t]] \sin[\Psi[t] - \theta_4[t]] + \cos[\Psi[t] - \theta_4[t]] \cot[b_2[t]] \tan[a_2[t]]) + \\
& \cos[\Psi[t]] \sec[a_2[t]] x_{p_2}[t] - \cot[b_2[t]] \sin[\Psi[t]] \tan[a_2[t]] x_{p_2}[t] - \\
& \cos[\Psi[t]] \sec[a_2[t]] x_{p_4}[t] + \cot[b_2[t]] \sin[\Psi[t]] \tan[a_2[t]] x_{p_4}[t] + \\
& \sec[a_2[t]] \sin[\Psi[t]] z_{p_2}[t] + \cos[\Psi[t]] \cot[b_2[t]] \tan[a_2[t]] z_{p_2}[t] - \\
& (\sec[a_2[t]] \sin[\Psi[t]] + \cos[\Psi[t]] \cot[b_2[t]] \tan[a_2[t]]) z_{p_4}[t]
\end{aligned}$$

FullSimplify[eqss[10] /. Sol1 /. Sol2]

$$\begin{aligned}
& (\sin[\theta_3[t]] - \sin[\theta_4[t]]) c_r + (-\sin[\gamma_3[t] - \phi_3[t]] + \sin[\gamma_4[t] - \phi_4[t]]) m_r + \\
& (-\sin[\gamma_3[t]] + \sin[\gamma_4[t]]) p_r + x_{p_4}[t] == x_{p_3}[t]
\end{aligned}$$