$m + m_p$	0	$2l_1 m_w s_{\alpha-\varphi_p} - m_p(x_F s_\alpha + y_F c_\alpha) - m_b\left(y_G c_{\alpha-\varphi_p} + x_G s_{\alpha-\varphi_p}\right)$	0	0	$-2l_1 m_w s_{\alpha-\varphi_p} + m_b\left(y_G c_{\alpha-\varphi_p} + x_G s_{\alpha-\varphi_p}\right)$
0	$m + m_p$	$m_p(x_F c_\alpha - y_F s_\alpha) - 2l_1 m_w c_{\alpha-\varphi_p} + m_b\left(x_G c_{\alpha-\varphi_p} - y_G s_{\alpha-\varphi_p}\right)$	0	0	$2l_1 m_w c_{\alpha-\varphi_p} + m_b\left(y_G s_{\alpha-\varphi_p} - x_G c_{\alpha-\varphi_p}\right)$
$2l_1 m_w s_{\alpha-\varphi_p} - m_p(x_F s_\alpha + y_F c_\alpha) - m_b\left(y_G c_{\alpha-\varphi_p} + x_G s_{\alpha-\varphi_p}\right)$	$m_p(x_F c_\alpha - y_F s_\alpha) - 2l_1 m_w c_{\alpha-\varphi_p} + m_b\left(x_G c_{\alpha-\varphi_p} - y_G s_{\alpha-\varphi_p}\right)$	$2I_t' + I_p' + I_b{}'$	0	0	$-2I_t' - I_b{}'$
0	0	0	I_a	0	0
0	0	0	0	I_a	0
$-2l_1 m_w s_{\alpha-\varphi_p} + m_b\left(y_G c_{\alpha-\varphi_p} + x_G s_{\alpha-\varphi_p}\right)$	$2l_1 m_w c_{\alpha-\varphi_p} + m_b\left(y_G s_{\alpha-\varphi_p} - x_G c_{\alpha-\varphi_p}\right)$	$-2I_t' - I_b{}'$	0	0	$2I_t' + I_b{}'$

$$m = m_b + 2m_w$$

$$I_t' = I_t + m_w\left({l_1}^2 + {l_2}^2\right)$$

$$I_p' = I_p + m_p({x_F}^2 + {y_F}^2)$$

$$I_b' = I_b + m_b({x_G}^2 + {y_G}^2)$$