0	0	$\dfrac{1}{2}\dot{\alpha}\left[2m_p(y_F s_\alpha - x_F c_\alpha) + 4l_1 m_w c_{\alpha-\varphi_p} + 2m_b\left(y_G s_{\alpha-\varphi_p} - x_G c_{\alpha-\varphi_p}\right)\right]$ $-\dfrac{1}{2}\dot{\varphi}_p\left[4l_1 m_w c_{\alpha-\varphi_p} + 2m_b\left(y_G s_{\alpha-\varphi_p} - x_G c_{\alpha-\varphi_p}\right)\right]$	0	0	$-(\dot{\alpha}-\dot{\varphi}_p)\left[2l_1 m_w c_{\alpha-\varphi_p} + m_b\left(y_G s_{\alpha-\varphi_p} - x_G c_{\alpha-\varphi_p}\right)\right]$
0	0	$\dfrac{1}{2}\dot{\varphi}_p\left[2m_b\left(y_G c_{\alpha-\varphi_p} + x_G s_{\alpha-\varphi_p}\right) - 4l_1 m_w s_{\alpha-\varphi_p}\right]$ $-\dfrac{1}{2}\dot{\alpha}\left[2m_p(y_F c_\alpha + x_F s_\alpha) + 2m_b\left(y_G c_{\alpha-\varphi_p} + x_G s_{\alpha-\varphi_p}\right) - 4l_1 m_w s_{\alpha-\varphi_p}\right]$	0	0	$-(\dot{\alpha}-\dot{\varphi}_p)\left[2l_1 m_w s_{\alpha-\varphi_p} - m_b\left(y_G c_{\alpha-\varphi_p} + x_G s_{\alpha-\varphi_p}\right)\right]$
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0