

$$h^{-1} i_{12} i_{13} i_{14} \rightarrow -\frac{1}{m_2^2} c_Y^2 \overline{y_u}^{i2i3} y_u^{i1i4} +$$

$$\left(-\frac{1}{72} - \frac{1}{m_2^2} (c_Y^2 (-9 \overline{y_d^p} y_d^{i1r} \overline{y_u}^{i2i3} y_u^{p14} (-1 + s_Y^2) + y_u^{i1i4} (\overline{y_u}^{i2i3} (17 g_1^2 + 27 g_2^2 + 96 g_3^2) + \right.$$

$$\left. 9 \overline{y_u}^{r13} (-\overline{y_d}^{i2p} y_d^{rp} (-1 + s_Y^2) + 3 \overline{y_u}^{i2p} y_u^{rp} (1 + c_Y^2))) + \right.$$

$$\left. 27 \overline{y_u}^{pr} \overline{y_u}^{i2i3} (y_u^{p14} y_u^{i1r} (1 + c_Y^2) - 8 s_Y^2 y_u^{rp} y_u^{i1i4}) + 16 g_3^2 \overline{y_u}^{p13} y_u^{p14} \delta_{i1i2} \right) +$$

$$8 g_3^2 (s_Y^2 \overline{y_d}^{i2p} y_d^{i1p} + c_Y^2 \overline{y_u}^{i2p} y_u^{i1p}) \delta_{i3i4} + \frac{2}{3} g_3^4 L_{F3,0}[m_3] \delta_{i1i2} \delta_{i3i4} +$$

$$g_3^4 L_{F4,-1}[m_3] \delta_{i1i2} \delta_{i3i4} - \frac{16}{15} g_3^4 L_{F5,-2}[m_3] \delta_{i1i2} \delta_{i3i4} -$$

$$\frac{1}{2} \sum_p c_Y g_1^2 \frac{1}{m_6^4} \overline{y_u}^{i2i3} y_u^{i1i4} (c_2 c_Y - 2 s_2 c_Y s_Y) L_{F1,0}[m_d^p] +$$

$$\frac{2}{9} \sum_p g_3^4 L_{F3,0}[m_d^p] \delta_{i1i2} \delta_{i3i4} - \frac{5}{12} \sum_p g_3^4 L_{F4,-1}[m_d^p] \delta_{i1i2} \delta_{i3i4} +$$

$$-\frac{8}{45} \sum_p g_3^4 L_{F5,-2}[m_d^p] \delta_{i1i2} \delta_{i3i4} -$$

$$3 s_Y c_Y \frac{1}{m_6^4} \overline{y_d^p} y_d^{pr} \overline{y_u}^{i2i3} y_u^{i1i4} (s_2 c_Y + s_Y c_Y) L_{F1,0}[m_d^r] -$$

$$\frac{1}{2} \sum_p c_Y g_1^2 \frac{1}{m_6^4} \overline{y_u}^{i2i3} y_u^{i1i4} (c_2 c_Y - 2 s_2 c_Y s_Y) L_{F1,0}[m_e^p] -$$

$$s_Y c_Y \frac{1}{m_6^4} \overline{y_e^p} y_e^{pr} \overline{y_u}^{i2i3} y_u^{i1i4} (s_2 c_Y + s_Y c_Y) L_{F1,0}[m_e^r] +$$

$$\frac{1}{2} c_Y \frac{1}{m_6^4} \overline{y_u}^{i2i3} y_u^{i1i4} (-2 s_Y \overline{y_e^p} y_e^{pr} (s_2 c_Y + s_Y c_Y) + \sum_p g_1^2 (c_2 c_Y - 2 s_2 c_Y s_Y)) L_{F1,0}[m_l^p] -$$

$$\frac{1}{2} c_Y \frac{1}{m_6^4} \overline{y_u}^{i2i3} y_u^{i1i4}$$

$$(6 s_Y \overline{y_d^p} y_d^{pr} (s_2 c_Y + s_Y c_Y) + 6 \overline{y_u}^{pr} y_u^{pr} (c_Y^3 - s_2 c_Y s_Y) + \sum_p g_1^2 (c_2 c_Y - 2 s_2 c_Y s_Y))$$

$$L_{F1,0}[m_q^p] + \frac{4}{9} \sum_p g_3^4 L_{F3,0}[m_q^p] \delta_{i1i2} \delta_{i3i4} -$$

$$\frac{5}{6} \sum_p g_3^4 L_{F4,-1}[m_q^p] \delta_{i1i2} \delta_{i3i4} + \frac{16}{45} \sum_p g_3^4 L_{F5,-2}[m_q^p] \delta_{i1i2} \delta_{i3i4} +$$

$$\sum_p c_Y g_1^2 \frac{1}{m_6^4} \overline{y_u}^{i2i3} y_u^{i1i4} (c_2 c_Y - 2 s_2 c_Y s_Y) L_{F1,0}[m_u^p] + \frac{2}{9} \sum_p g_3^4 L_{F3,0}[m_u^p] \delta_{i1i2} \delta_{i3i4} -$$

$$\frac{5}{12} \sum_p g_3^4 L_{F4,-1}[m_u^p] \delta_{i1i2} \delta_{i3i4} + \frac{8}{45} \sum_p g_3^4 L_{F5,-2}[m_u^p] \delta_{i1i2} \delta_{i3i4} -$$

$$3 c_Y \frac{1}{m_6^4} \overline{y_u}^{pr} \overline{y_u}^{i2i3} y_u^{pr} y_u^{i1i4} (c_Y^3 - s_2 c_Y s_Y) L_{F1,0}[m_u^r] +$$

$$\frac{1}{4} c_Y \frac{1}{m_6^4} \overline{y_u}^{i2i3} y_u^{i1i4} (c_Y (g_1^2 (1 - 3 c_Y^2) - 3 g_2^2 (-1 + c_2 c_Y^2)) + 3 s_4 c_Y s_Y (g_1^2 + g_2^2))$$

$$L_{F1,0}[m_\Phi] + \frac{1}{4} \frac{1}{m_6^2} c_Y^2 (3 \overline{y_u}^{i2i3} y_u^{p14} (-s_Y^2 \overline{y_d^p} y_d^{i1r} + c_Y^2 \overline{y_u}^{pr} y_u^{i1r}) -$$

$$y_u^{i1i4} (2 \overline{y_u}^{i2i3} (g_1^2 + 3 g_2^2) + 3 \overline{y_u}^{r13} (s_Y^2 \overline{y_d}^{i2p} y_d^{rp} - c_Y^2 \overline{y_u}^{i2p} y_u^{rp})) L_{F1,1}[m_\Phi] +$$

$$\frac{1}{12} (c_Y^2 (6 s_Y^2 \overline{y_d^p} y_d^{i1r} \overline{y_u}^{i2i3} y_u^{p14} + 3 y_u^{i1i4} (\overline{y_u}^{i2i3} (g_1^2 + 3 g_2^2) + 2 s_Y^2 \overline{y_d}^{i2p} y_d^{rp} \overline{y_u}^{r13}) -$$

$$8 g_3^2 \overline{y_u}^{p13} y_u^{p14} \delta_{i1i2}) - 4 g_3^2 (s_Y^2 \overline{y_d}^{i2p} y_d^{i1p} + c_Y^2 \overline{y_u}^{i2p} y_u^{i1p}) \delta_{i3i4}) L_{F1,2}[m_\Phi] +$$

$$\frac{1}{36} g_1^2 \frac{1}{m_6^2} c_Y^2 \overline{y_u}^{i2i3} y_u^{i1i4} L_{F1,1,0}[m_1, m_q^{i1}] - \frac{1}{72} g_1^2 \frac{1}{m_6^2} c_Y^2 \overline{y_u}^{i2i3} y_u^{i1i4} L_{F2,1,-1}[m_1, m_q^{i1}]$$

$$\frac{1}{36} g_1^2 \frac{1}{m_6^2} c_Y^2 \overline{y_u}^{i2i3} y_u^{i1i4} L_{F1,1,0}[m_1, m_q^{i2}] - \frac{1}{72} g_1^2 \frac{1}{m_6^2} c_Y^2 \overline{y_u}^{i2i3} y_u^{i1i4} L_{F2,1,-1}[m_1, m_q^{i2}]$$

$$-\frac{1}{108} g_1^2 g_3^2 L_{F2,1,0}[m_1, m_q^{i2}] \delta_{i1i2} \delta_{i3i4} + \frac{1}{108} g_1^2 g_3^2 L_{F2,2,-1}[m_1, m_q^{i2}] \delta_{i1i2} \delta_{i3i4} -$$

$$\frac{1}{54} g_1^2 g_3^2 L_{F3,1,-1}[m_1, m_q^{i2}] \delta_{i1i2} \delta_{i3i4} + \frac{1}{108} g_1^2 g_3^2 L_{F4,1,-2}[m_1, m_q^{i2}] \delta_{i1i2} \delta_{i3i4} +$$

$$\frac{4}{9} g_1^2 \frac{1}{m_6^2} c_Y^2 \overline{y_u}^{i2i3} y_u^{i1i4} L_{F1,1,0}[m_1, m_u^{i3}] - \frac{2}{9} g_1^2 \frac{1}{m_6^2} c_Y^2 \overline{y_u}^{i2i3} y_u^{i1i4} L_{F2,1,-1}[m_1, m_u^{i3}] +$$

$$\frac{4}{9} g_1^2 \frac{1}{m_6^2} c_Y^2 \overline{y_u}^{i2i3} y_u^{i1i4} L_{F1,1,0}[m_1, m_u^{i4}] - \frac{2}{9} g_1^2 \frac{1}{m_6^2} c_Y^2 \overline{y_u}^{i2i3} y_u^{i1i4} L_{F2,1,-1}[m_1, m_u^{i4}] +$$

$$\frac{4}{27} g_1^2 g_3^2 L_{F2,1,0}[m_1, m_u^{i4}] \delta_{i1i2} \delta_{i3i4} + \frac{4}{27} g_1^2 g_3^2 L_{F2,2,-1}[m_1, m_u^{i4}] \delta_{i1i2} \delta_{i3i4} -$$

$$\frac{8}{27} g_1^2 g_3^2 L_{F3,1,-1}[m_1, m_u^{i4}] \delta_{i1i2} \delta_{i3i4} + \frac{4}{27} g_1^2 g_3^2 L_{F4,1,-2}[m_1, m_u^{i4}] \delta_{i1i2} \delta_{i3i4} +$$

$$g_1^2 \frac{1}{m_6^4} c_Y^2 \overline{y_u}^{i2i3} y_u^{i1i4} (c_Y^2 + s_Y^2) L_{F1,1,-1}[m_1, \tilde{\mu}] +$$

$$2 m_1 s_Y \tilde{\mu} c_Y g_1^2 \frac{1}{m_6^4} \overline{y_u}^{i2i3} y_u^{i1i4} (-2 c_Y^2 + s_Y^2) L_{F1,1,0}[m_1, \tilde{\mu}] +$$

$$\frac{3}{4} g_2^2 \frac{1}{m_6^2} c_Y^2 \overline{y_u}^{i2i3} y_u^{i1i4} L_{F1,1,0}[m_2, m_q^{i1}] - \frac{3}{8} g_2^2 \frac{1}{m_6^2} c_Y^2 \overline{y_u}^{i2i3} y_u^{i1i4} L_{F2,1,-1}[m_2, m_q^{i1}] +$$

$$\frac{3}{4} g_2^2 \frac{1}{m_6^2} c_Y^2 \overline{y_u}^{i2i3} y_u^{i1i4} L_{F1,1,0}[m_2, m_q^{i2}] - \frac{3}{8} g_2^2 \frac{1}{m_6^2} c_Y^2 \overline{y_u}^{i2i3} y_u^{i1i4} L_{F2,1,-1}[m_2, m_q^{i2}] +$$

$$\frac{1}{4} g_2^2 g_3^2 L_{F2,1,0}[m_2, m_q^{i2}] \delta_{i1i2} \delta_{i3i4} + \frac{1}{4} g_2^2 g_3^2 L_{F2,2,-1}[m_2, m_q^{i2}] \delta_{i1i2} \delta_{i3i4} -$$

$$\frac{1}{2} g_2$$