

Appendix A

$$v_4 = v_{40} + v_{41} + v_{42} + v_{43} + v_{44},$$

$$v_{40} = \lambda\omega_2(2n\sigma_{32} - \lambda\omega_2 A_{\tilde{x}}),$$

$$v_{41} = \frac{3}{2}C_3(-2A_{\tilde{x}}(2\rho_{40} + \rho_{41}) + 2\rho_{31}(\rho_{21} - \rho_{22}) - kA_{\tilde{x}}\sigma_{41} - (\sigma_{21} - \sigma_{22})(\sigma_{31} + \sigma_{32}) \\ - (-1)^{\frac{p-1}{2}} A_{\tilde{z}}(2k_{40} + k_{41}) - k_{21}k_{32}),$$

$$v_{42} = \frac{3}{2}C_4(2A_{\tilde{x}}^2\rho_{31} - 4A_{\tilde{x}}((\rho_{20} + \rho_{21} - \rho_{22})^2 + \rho_{20}^2) + 2kA_{\tilde{x}}^2(\sigma_{31} + \sigma_{32}) \\ + 2A_{\tilde{x}}(\sigma_{21} - \sigma_{22})^2 - 4kA_{\tilde{x}}\rho_{20}(\sigma_{21} - \sigma_{22}) + k^2A_{\tilde{x}}^2\rho_{31} + 2A_{\tilde{x}}A_{\tilde{z}}k_{32} \\ + 2A_{\tilde{x}}(k_{21}^2 + 2k_{21}k_{22} + 2k_{22}^2) - 4A_{\tilde{z}}(k_{21} + k_{22})(\rho_{20} + \rho_{21} - \rho_{22}) - A_{\tilde{z}}^2\rho_{31}),$$

$$v_{43} = \frac{5}{2}C_5(-2A_{\tilde{x}}^3(3\rho_{20} + 2(\rho_{21} - \rho_{22})) - 3kA_{\tilde{x}}^3(\sigma_{21} - \sigma_{22}) + 3k^2A_{\tilde{x}}^3\rho_{20} \\ - 3A_{\tilde{x}}^2A_{\tilde{z}}(2k_{21} + 3k_{22}) + 3A_{\tilde{x}}A_{\tilde{z}}^2(3\rho_{20} + 2(\rho_{21} - \rho_{22})) + \frac{3}{4}k^3A_{\tilde{x}}^3(\sigma_{21} - \sigma_{22}) \\ + \frac{3}{4}k^2A_{\tilde{x}}^2A_{\tilde{z}}k_{22} + \frac{3}{4}kA_{\tilde{x}}A_{\tilde{z}}^2(\sigma_{21} - \sigma_{22}) + \frac{3}{4}A_{\tilde{z}}^3(2k_{21} + 3k_{22})),$$

$$v_{44} = \frac{15}{32}C_6(-8A_{\tilde{x}}^5 + 8k^2A_{\tilde{x}}^5 + 40A_{\tilde{x}}^3A_{\tilde{z}}^2 - 3k^4A_{\tilde{x}}^5 - 6k^2A_{\tilde{x}}^3A_{\tilde{z}}^2 - 15A_{\tilde{x}}A_{\tilde{z}}^4).$$

$$v_5 = v_{50} + v_{51} + v_{52} + v_{53} + v_{54}$$

$$v_{50} = \omega_2\lambda^2(2\sigma_{32} + \omega_2kA_{\tilde{x}}),$$

$$v_{51} = -\frac{3}{2}C_3(-A_{\tilde{x}}\sigma_{41} + 2\rho_{20}\sigma_{32} + (\rho_{21} - \rho_{22})(\sigma_{31} - \sigma_{32}) - \rho_{31}(\sigma_{21} - \sigma_{22}) \\ + kA_{\tilde{x}}(2\rho_{40} - \rho_{41})),$$

$$v_{52} = -\frac{3}{8}C_4(4A_{\tilde{x}}^2(\sigma_{31} + \sigma_{32}) - 16A_{\tilde{x}}\rho_{20}(\sigma_{21} - \sigma_{22}) + 8kA_{\tilde{x}}^2\rho_{31} \\ + 8kA_{\tilde{x}}(2\rho_{20}^2 - 2\rho_{20}(\rho_{21} - \rho_{22}) + (\rho_{21} - \rho_{22})^2) + 3k^2A_{\tilde{x}}^2(\sigma_{31} - \sigma_{32}) \\ - 6kA_{\tilde{x}}(\sigma_{21} - \sigma_{22})^2 + 2kA_{\tilde{x}}A_{\tilde{z}}k_{32} - 2kA_{\tilde{x}}(k_{21}^2 - 2k_{21}k_{22} + 2k_{22}^2) \\ - 4A_{\tilde{z}}k_{22}(\sigma_{21} - \sigma_{22}) - A_{\tilde{z}}^2(\sigma_{31} + \sigma_{32})),$$

$$\begin{aligned}
v_{53} &= \frac{5}{8}C_5(4A_{\bar{x}}^3(\sigma_{21} - \sigma_{22}) + 3k^3A_{\bar{x}}^3(3\rho_{20} - 2(\rho_{21} - \rho_{22})) - 9k^2A_{\bar{x}}^3(\sigma_{21} - \sigma_{22}) \\
&\quad - 12kA_{\bar{x}}^3\rho_{20} - 6kA_{\bar{x}}^2A_{\bar{z}}k_{22} - 3A_{\bar{x}}A_{\bar{z}}^2(\sigma_{21} - \sigma_{22}) + 3kA_{\bar{x}}A_{\bar{z}}^2\rho_{20}), \\
v_{54} &= \frac{15}{64}C_6(-8kA_{\bar{x}}^5 + 12k^3A_{\bar{x}}^5 + 12kA_{\bar{x}}^3A_{\bar{z}}^2 - 5k^5A_{\bar{x}}^5 - 2k^3A_{\bar{x}}^3A_{\bar{z}}^2 - kA_{\bar{x}}A_{\bar{z}}^4). \\
v_6 &= \begin{cases} v_{60} + v_{61} + v_{62} + v_{63} + v_{64}, & \text{when } p = 1, \\ -v_{60} + v_{65} + v_{66} + v_{67} + v_{68}, & \text{when } p = 3. \end{cases} \\
v_{60} &= \omega_2^2\lambda^2A_{\bar{z}}, \\
v_{61} &= -\frac{3}{2}C_3(-A_{\bar{x}}(2k_{40} + k_{41}) + k_{32}(\rho_{21} - \rho_{22}) + \rho_{31}k_{21} + A_{\bar{z}}(2\rho_{40} + \rho_{41})), \\
v_{62} &= -\frac{3}{2}C_4(A_{\bar{x}}^2k_{32} - 4A_{\bar{x}}(\rho_{20}(k_{21} + 2k_{22}) + (\rho_{21} - \rho_{22})(k_{21} + k_{22})) - 2A_{\bar{x}}A_{\bar{z}}\rho_{31} \\
&\quad + 2A_{\bar{z}}\{2\rho_{20}(\rho_{20} + \rho_{21} - \rho_{22}) + (\rho_{21} - \rho_{22})^2\} + \frac{1}{4}k^2A_{\bar{x}}^2k_{32} - kA_{\bar{x}}k_{22}(\sigma_{21} - \sigma_{22}) \\
&\quad - \frac{1}{2}kA_{\bar{x}}A_{\bar{z}}(\sigma_{31} + \sigma_{32}) - \frac{3}{4}A_{\bar{z}}^2k_{32} - \frac{1}{2}A_{\bar{z}}(\sigma_{21} - \sigma_{22})^2 \\
&\quad - \frac{3}{2}A_{\bar{z}}(k_{21}^2 + 2k_{21}k_{22} + 2k_{22}^2)), \\
v_{63} &= -\frac{5}{8}C_5(-4A_{\bar{x}}^3(2k_{21} + 3k_{22}) + 12A_{\bar{x}}^2A_{\bar{z}}(3\rho_{20} + 2(\rho_{21} - \rho_{22})) \\
&\quad + 9A_{\bar{x}}A_{\bar{z}}^2(2k_{21} + 3k_{22}) - 3A_{\bar{z}}^3(3\rho_{20} + 2(\rho_{21} - \rho_{22})) + 3k^2A_{\bar{x}}^3k_{22} \\
&\quad + 6kA_{\bar{x}}^2A_{\bar{z}}(\sigma_{21} - \sigma_{22}) - 3k^2A_{\bar{x}}^2A_{\bar{z}}\rho_{20}), \\
v_{64} &= \frac{15}{64}C_6(-40A_{\bar{x}}^4A_{\bar{z}} + 12k^2A_{\bar{x}}^4A_{\bar{z}} + 60A_{\bar{x}}^2A_{\bar{z}}^3 - k^4A_{\bar{x}}^4A_{\bar{z}} - 2k^2A_{\bar{x}}^2A_{\bar{z}}^3 - 5A_{\bar{z}}^5), \\
v_{65} &= -\frac{3}{2}C_3(-A_{\bar{x}}(2k_{40} + k_{41}) - k_{32}(\rho_{21} - \rho_{22}) - \rho_{31}k_{21} - A_{\bar{z}}(2\rho_{40} + \rho_{41})), \\
v_{66} &= -\frac{3}{2}C_4(-A_{\bar{x}}^2k_{32} + 4A_{\bar{x}}(\rho_{20}(k_{21} + 2k_{22}) + (\rho_{21} - \rho_{22})(k_{21} + k_{22})) + 2A_{\bar{x}}A_{\bar{z}}\rho_{31} \\
&\quad - 2A_{\bar{z}}\{2\rho_{20}(\rho_{20} + \rho_{21} - \rho_{22}) + (\rho_{21} - \rho_{22})^2\} - \frac{1}{4}k^2A_{\bar{x}}^2k_{32} + kA_{\bar{x}}k_{22}(\sigma_{21} - \sigma_{22}) \\
&\quad + \frac{1}{2}kA_{\bar{x}}A_{\bar{z}}(\sigma_{31} + \sigma_{32}) + \frac{3}{4}A_{\bar{z}}^2k_{32} + \frac{1}{2}A_{\bar{z}}(\sigma_{21} - \sigma_{22})^2 \\
&\quad + \frac{3}{2}A_{\bar{z}}(k_{21}^2 + 2k_{21}k_{22} + 2k_{22}^2)), \\
v_{67} &= -\frac{5}{8}C_5(4A_{\bar{x}}^3(2k_{21} + 3k_{22}) - 12A_{\bar{x}}^2A_{\bar{z}}(3\rho_{20} + 2(\rho_{21} - \rho_{22})) - 9A_{\bar{x}}A_{\bar{z}}^2(2k_{21} + 3k_{22}) \\
&\quad + 3A_{\bar{z}}^3(3\rho_{20} + 2(\rho_{21} - \rho_{22})) - 3k^2A_{\bar{x}}^3k_{22} - 6kA_{\bar{x}}^2A_{\bar{z}}(\sigma_{21} - \sigma_{22}) + 3k^2A_{\bar{x}}^2A_{\bar{z}}\rho_{20}), \\
v_{68} &= \frac{15}{64}C_6(40A_{\bar{x}}^4A_{\bar{z}} - 12k^2A_{\bar{x}}^4A_{\bar{z}} - 60A_{\bar{x}}^2A_{\bar{z}}^3 + k^4A_{\bar{x}}^4A_{\bar{z}} + 2k^2A_{\bar{x}}^2A_{\bar{z}}^3 + 5A_{\bar{z}}^5). \\
\gamma_8 &= \gamma_{80} + \gamma_{81} + \gamma_{82} + \gamma_{83} + \gamma_{84}
\end{aligned}$$

$$\gamma_{80} = 6\lambda\omega_2(3\lambda\rho_{31} + n\sigma_{31}),$$

$$\begin{aligned}\gamma_{81} = & \frac{3}{2}C_3(-2A_{\bar{x}}(\rho_{41} + \rho_{42}) + 4\rho_{20}\rho_{31} + kA_{\bar{x}}(\sigma_{41} - \sigma_{42}) + \sigma_{32}(\sigma_{21} - \sigma_{22}) \\ & - (-1)^{\frac{p-1}{2}}A_{\bar{z}}(k_{41} + k_{42}) - 2k_{22}k_{32}),\end{aligned}$$

$$\begin{aligned}\gamma_{82} = & \frac{3}{2}C_4(4A_{\bar{x}}^2\rho_{31} - 2A_{\bar{x}}(\rho_{21} - \rho_{22})(4\rho_{20} + \rho_{21} - \rho_{22}) - 2kA_{\bar{x}}^2\sigma_{32} \\ & - A_{\bar{x}}(\sigma_{21} - \sigma_{22})^2 + 2kA_{\bar{x}}(\sigma_{21} - \sigma_{22})(2\rho_{20} - (\rho_{21} - \rho_{22})) \\ & - 2k^2A_{\bar{x}}^2\rho_{31} + 4A_{\bar{x}}A_{\bar{z}}k_{32}) + A_{\bar{x}}(k_{21}^2 + 4k_{21}k_{22} - 2A_{\bar{z}}(k_{21}(2\rho_{20} + \rho_{21} - \rho_{22}) \\ & + 2k_{22}(\rho_{21} - \rho_{22})) - 2A_{\bar{z}}^2\rho_{31}),\end{aligned}$$

$$\begin{aligned}\gamma_{83} = & \frac{5}{16}C_5(-8A_{\bar{x}}^3(2\rho_{20} + 3(\rho_{21} - \rho_{22})) + 12kA_{\bar{x}}^3(\sigma_{21} - \sigma_{22}) - 12A_{\bar{x}}^2A_{\bar{z}}(3k_{21} + 2k_{22}) \\ & - 12k^2A_{\bar{x}}^3(2\rho_{20} - (\rho_{21} - \rho_{22})) + 12A_{\bar{x}}A_{\bar{z}}^2(2\rho_{20} + 3(\rho_{21} - \rho_{22})) \\ & - 9k^3A_{\bar{x}}^3(\sigma_{21} - \sigma_{22}) + 3k^2A_{\bar{x}}^2A_{\bar{z}}(k_{21} - 2k_{22}) - 3kA_{\bar{x}}A_{\bar{z}}^2(\sigma_{21} - \sigma_{22}) \\ & + 3A_{\bar{z}}^3(3k_{21} + 2k_{22})),\end{aligned}$$

$$\gamma_{84} = \frac{15}{64}C_6(-8A_{\bar{x}}^5 - 8k^2A_{\bar{x}}^5 + 40A_{\bar{x}}^3A_{\bar{z}}^2 + 9k^4A_{\bar{x}}^5 + 6k^2A_{\bar{x}}^3A_{\bar{z}}^2 - 15A_{\bar{x}}A_{\bar{z}}^4).$$

$$\gamma_9 = \gamma_{91} + \gamma_{92} + \gamma_{93} + \gamma_{94},$$

$$\begin{aligned}\gamma_{91} = & \frac{3}{2}C_3(-2A_{\bar{x}}\rho_{42} + 2\rho_{31}(\rho_{21} - \rho_{22}) + kA_{\bar{x}}\sigma_{42} + \sigma_{31}(\sigma_{21} - \sigma_{22}) - (-1)^{\frac{p-1}{2}}A_{\bar{z}}k_{42} \\ & - k_{21}k_{31}),\end{aligned}$$

$$\begin{aligned}\gamma_{92} = & \frac{3}{2}C_4(2A_{\bar{x}}^2\rho_{31} - 2A_{\bar{x}}(\rho_{21} - \rho_{22})^2 - 2kA_{\bar{x}}^2\sigma_{31} - A_{\bar{x}}(\sigma_{21} - \sigma_{22})^2 \\ & + 2kA_{\bar{x}}(\sigma_{21} - \sigma_{22})(\rho_{21} - \rho_{22}) + k^2A_{\bar{x}}^2\rho_{31} + 2A_{\bar{x}}A_{\bar{z}}k_{32} + A_{\bar{x}}k_{21}^2 - 2A_{\bar{z}}k_{21}(\rho_{21} \\ & - \rho_{22}) - A_{\bar{z}}^2\rho_{31}),\end{aligned}$$

$$\begin{aligned}\gamma_{93} = & \frac{5}{16}C_5(-8A_{\bar{x}}^3(\rho_{21} - \rho_{22}) + 12kA_{\bar{x}}^3(\sigma_{21} - \sigma_{22}) - 12k^2A_{\bar{x}}^3(\rho_{21} - \rho_{22}) - 12A_{\bar{x}}^2A_{\bar{z}}k_{21} \\ & + 12A_{\bar{x}}A_{\bar{z}}^2(\rho_{21} - \rho_{22}) + 3k^3A_{\bar{x}}^3(\sigma_{21} - \sigma_{22}) - 3k^2A_{\bar{x}}^2A_{\bar{z}}k_{21} - 3kA_{\bar{x}}A_{\bar{z}}^2(\sigma_{21} - \sigma_{22}) \\ & + 3A_{\bar{z}}^2k_{21}),\end{aligned}$$

$$\gamma_{94} = \frac{3}{64}C_6(-8A_{\bar{x}}^5 - 40k^2A_{\bar{x}}^5 + 40A_{\bar{x}}^3A_{\bar{z}}^2 - 15k^4A_{\bar{x}}^5 + 30k^2A_{\bar{x}}^3A_{\bar{z}}^2 - 15A_{\bar{x}}A_{\bar{z}}^4).$$

$$\beta_9 = \beta_{90} + \beta_{91} + \beta_{92} + \beta_{93} + \beta_{94},$$

$$\beta_{90} = 6\lambda\omega_2(3\lambda\sigma_{31} + n\rho_{31}),$$

$$\beta_{91} = -\frac{3}{2}C_3(-A_{\bar{x}}(\sigma_{41} + \sigma_{42}) + 2\rho_{20}\sigma_{31} + \sigma_{32}(\rho_{21} - \rho_{22}) + kA_{\bar{x}}(\rho_{41} - \rho_{42})),$$

$$\begin{aligned}
\beta_{92} &= -\frac{3}{8}C_4(4A_{\bar{x}}^2(2\sigma_{31} + \sigma_{32}) - 8A_{\bar{x}}(\sigma_{21} - \sigma_{22})(2\rho_{20} + \rho_{21} - \rho_{22}) \\
&\quad + 4kA_{\bar{x}}(\rho_{21} - \rho_{22})(4\rho_{20} - (\rho_{21} - \rho_{22})) - 3k^2A_{\bar{x}}^2(2\sigma_{31} + \sigma_{32}) - 3kA_{\bar{x}}(\sigma_{21} - \sigma_{22})^2 \\
&\quad - kA_{\bar{x}}(4k_{21}k_{22} - k_{21}^2) - 2A_{\bar{z}}(k_{21} + 2k_{22})(\sigma_{21} - \sigma_{22}) - A_{\bar{z}}^2(2\sigma_{31} + \sigma_{32})), \\
\beta_{93} &= \frac{5}{16}C_5(12A_{\bar{x}}^3(\sigma_{21} - \sigma_{22}) - 12kA_{\bar{x}}^3(2\rho_{20} + \rho_{21} - \rho_{22}) + 3k^3A_{\bar{x}}^3(-2\rho_{20} + 3(\rho_{21} - \rho_{22})) \\
&\quad - 9k^2A_{\bar{x}}^3(\sigma_{21} - \sigma_{22}) - 6kA_{\bar{x}}^2A_{\bar{z}}(k_{21} + 2k_{22}) - 9A_{\bar{x}}A_{\bar{z}}^2(\sigma_{21} - \sigma_{22}) \\
&\quad + 3kA_{\bar{x}}A_{\bar{z}}^2(2\rho_{20} + \rho_{21} - \rho_{22})), \\
\beta_{94} &= \frac{15}{128}C_6(-24kA_{\bar{x}}^5 + 12k^3A_{\bar{x}}^5 + 36kA_{\bar{x}}^3A_{\bar{z}}^2 + 5k^5A_{\bar{x}}^5 - 2k^3A_{\bar{x}}^3A_{\bar{z}}^2 - 3kA_{\bar{x}}A_{\bar{z}}^4). \\
\beta_{10} &= \beta_{101} + \beta_{102} + \beta_{103} + \beta_{104}, \\
\beta_{101} &= -\frac{3}{2}C_3(-A_{\bar{x}}\sigma_{42} + \sigma_{31}(\rho_{21} - \rho_{22}) + \rho_{31}(\sigma_{21} - \sigma_{22}) + kA_{\bar{x}}\rho_{42}), \\
\beta_{102} &= -\frac{3}{8}C_4(4A_{\bar{x}}^2\sigma_{31} - 8A_{\bar{x}}(\sigma_{21} - \sigma_{22})(\rho_{21} - \rho_{22}) - 8kA_{\bar{x}}^2\rho_{31} + 4kA_{\bar{x}}(\rho_{21} - \rho_{22})^2 \\
&\quad + 3k^2A_{\bar{x}}^2\sigma_{31} + 3kA_{\bar{x}}(\sigma_{21} - \sigma_{22})^2 - 2kA_{\bar{x}}A_{\bar{z}}k_{32} - kA_{\bar{x}}k_{21}^2 - 2A_{\bar{z}}k_{21}(\sigma_{21} - \sigma_{22}) \\
&\quad - A_{\bar{z}}^2\sigma_{31}), \\
\beta_{103} &= +\frac{5}{16}C_5(4A_{\bar{x}}^3(\sigma_{21} - \sigma_{22}) - 12kA_{\bar{x}}^3(\rho_{21} - \rho_{22}) - 3k^3A_{\bar{x}}^3(\rho_{21} - \rho_{22}) \\
&\quad + 9k^2A_{\bar{x}}^3(\sigma_{21} - \sigma_{22}) - 6kA_{\bar{x}}^2A_{\bar{z}}k_{21} - 3A_{\bar{x}}A_{\bar{z}}^2(\sigma_{21} - \sigma_{22}) + 3kA_{\bar{x}}A_{\bar{z}}^2(\rho_{21} - \rho_{22})), \\
\beta_{104} &= \frac{15}{128}C_6(-8kA_{\bar{x}}^5 - 12k^3A_{\bar{x}}^5 + 12kA_{\bar{x}}^3A_{\bar{z}}^2 - k^5A_{\bar{x}}^5 - 2k^3A_{\bar{x}}^3A_{\bar{z}}^2 - kA_{\bar{x}}A_{\bar{z}}^4). \\
\delta_8 &= \begin{cases} \delta_{80} + \delta_{81} + \delta_{82} + \delta_{83} + \delta_{84}, & \text{when } p = 1, \\ -\delta_{80} + \delta_{85} + \delta_{86} + \delta_{87} + \delta_{88}, & \text{when } p = 3. \end{cases} \\
\delta_{80} &= 18\omega_2\lambda^2k_{32}, \\
\delta_{81} &= -\frac{3}{2}C_3(-A_{\bar{x}}(k_{41} + k_{42}) + A_{\bar{z}}(\rho_{41} + \rho_{42}) + 2\rho_{31}k_{22} + 2\rho_{20}k_{32}), \\
\delta_{82} &= -\frac{3}{8}C_4(8A_{\bar{x}}^2k_{32} - 8A_{\bar{x}}(2\rho_{20}k_{21} + (\rho_{21} - \rho_{22})(k_{21} + 2k_{22})) - 16A_{\bar{x}}A_{\bar{z}}\rho_{31} \\
&\quad + 4A_{\bar{z}}(\rho_{21} - \rho_{22})(4\rho_{20} + \rho_{21} - \rho_{22}) - 2kA_{\bar{x}}(k_{21} - 2k_{22})(\sigma_{21} - \sigma_{22}) \\
&\quad - 2k^2A_{\bar{x}}^2k_{32} + 2kA_{\bar{x}}A_{\bar{z}}\sigma_{32} - 6A_{\bar{z}}^2k_{32} + A_{\bar{z}}(\sigma_{21} - \sigma_{22})^2 - 3A_{\bar{z}}k_{21}(k_{21} + 4k_{22})), \\
\delta_{83} &= -\frac{5}{16}C_5(-4A_{\bar{x}}^3(3k_{21} + 2k_{22}) + 12A_{\bar{x}}^2A_{\bar{z}}(2\rho_{20} + 3(\rho_{21} - \rho_{22})) + 9A_{\bar{x}}A_{\bar{z}}^2(3k_{21} \\
&\quad + 2k_{22}) - 3A_{\bar{z}}^3(2\rho_{20} + 3(\rho_{21} - \rho_{22})) + 3k^2A_{\bar{x}}^3(k_{21} - 2k_{22}) - 6kA_{\bar{x}}^2A_{\bar{z}}(\sigma_{21} - \sigma_{22}) \\
&\quad + 3k^2A_{\bar{x}}^2A_{\bar{z}}(2\rho_{20} - (\rho_{21} - \rho_{22}))),
\end{aligned}$$

$$\begin{aligned}
\delta_{84} &= \frac{15}{128}C_6(-40A_{\bar{x}}^4A_{\bar{z}} - 12k^2A_{\bar{x}}^4A_{\bar{z}} + 60A_{\bar{x}}^2A_{\bar{z}}^3 + 3k^4A_{\bar{x}}^4A_{\bar{z}} + 2k^2A_{\bar{x}}^2A_{\bar{z}}^3 - A_{\bar{z}}^5) \\
&\quad + \frac{\Delta}{\epsilon^2}k_{32}, \\
\delta_{85} &= -\frac{3}{2}C_3(-A_{\bar{x}}(k_{41} + k_{42}) - A_{\bar{z}}(\rho_{41} + \rho_{42}) - 2\rho_{31}k_{22} - 2\rho_{20}k_{32}), \\
\delta_{86} &= -\frac{3}{8}C_4(-8A_{\bar{x}}^2k_{32} + 8A_{\bar{x}}(2\rho_{20}k_{21} + (\rho_{21} - \rho_{22})(k_{21} + 2k_{22})) + 16A_{\bar{x}}A_{\bar{z}}\rho_{31} \\
&\quad + 2k^2A_{\bar{x}}^2k_{32} + 6A_{\bar{z}}^2k_{32} - 4A_{\bar{z}}(\rho_{21} - \rho_{22})(4\rho_{20} + \rho_{21} - \rho_{22}) \\
&\quad + 2kA_{\bar{x}}(k_{21} - 2k_{22})(\sigma_{21} - \sigma_{22}) - 2kA_{\bar{x}}A_{\bar{z}}\sigma_{32} - A_{\bar{z}}(\sigma_{21} - \sigma_{22})^2 + 3A_{\bar{z}}k_{21}(k_{21} \\
&\quad + 4k_{22})), \\
\delta_{87} &= -\frac{5}{16}C_5(4A_{\bar{x}}^3(3k_{21} + 2k_{22}) - 12A_{\bar{x}}^2A_{\bar{z}}(2\rho_{20} + 3(\rho_{21} - \rho_{22})) - 9A_{\bar{x}}A_{\bar{z}}^2(3k_{21} + 2k_{22}) \\
&\quad + 3A_{\bar{z}}^3(2\rho_{20} + 3(\rho_{21} - \rho_{22})) - 3k^2A_{\bar{x}}^3(k_{21} - 2k_{22}) + 6kA_{\bar{x}}^2A_{\bar{z}}(\sigma_{21} - \sigma_{22}) \\
&\quad - 3k^2A_{\bar{x}}^2A_{\bar{z}}(2\rho_{20} - (\rho_{21} - \rho_{22}))), \\
\delta_{88} &= \frac{15}{128}C_6(40A_{\bar{x}}^4A_{\bar{z}} + 12k^2A_{\bar{x}}^4A_{\bar{z}} - 60A_{\bar{x}}^2A_{\bar{z}}^3 - 3k^4A_{\bar{x}}^4A_{\bar{z}} - 2k^2A_{\bar{x}}^2A_{\bar{z}}^3 + 5A_{\bar{z}}^5) \\
&\quad - \frac{\Delta}{\epsilon^2}k_{32}. \\
\delta_9 &= \begin{cases} \delta_{91} + \delta_{92} + \delta_{93} + \delta_{94}, & \text{when } p = 1, \\ \delta_{95} + \delta_{96} + \delta_{97} + \delta_{98}, & \text{when } p = 3. \end{cases} \\
\delta_{91} &= \frac{3}{2}C_3(A_{\bar{x}}k_{42} - k_{32}(\rho_{21} - \rho_{22}) - \rho_{31}k_{21} + A_{\bar{z}}\rho_{42}), \\
\delta_{92} &= -\frac{3}{8}C_4(4A_{\bar{x}}^2k_{32} - 8A_{\bar{x}}k_{21}(\rho_{21} - \rho_{22}) - 8A_{\bar{x}}A_{\bar{z}}\rho_{31} + 4A_{\bar{z}}(\rho_{21} - \rho_{22})^2 \\
&\quad + k^2A_{\bar{x}}^2k_{32} + 2kA_{\bar{x}}k_{21}(\sigma_{21} - \sigma_{22}) + 2kA_{\bar{x}}A_{\bar{z}}\sigma_{31} - 3A_{\bar{z}}^2k_{32} + A_{\bar{z}}(\sigma_{21} - \sigma_{22})^2 \\
&\quad - 3A_{\bar{z}}k_{21}^2), \\
\delta_{93} &= -\frac{5}{16}C_5(-4A_{\bar{x}}^3k_{21} + 12A_{\bar{x}}^2A_{\bar{z}}(\rho_{21} - \rho_{22}) + 9A_{\bar{x}}A_{\bar{z}}^2k_{21} - 3A_{\bar{z}}^3(\rho_{21} - \rho_{22}) \\
&\quad - 3k^2A_{\bar{x}}^3k_{21} - 6kA_{\bar{x}}^2A_{\bar{z}}(\sigma_{21} - \sigma_{22}) + 3k^2A_{\bar{x}}^2A_{\bar{z}}(\rho_{21} - \rho_{22})), \\
\delta_{94} &= \frac{15}{128}C_6(-8A_{\bar{x}}^4A_{\bar{z}} - 12k^2A_{\bar{x}}^4A_{\bar{z}} + 12A_{\bar{x}}^2A_{\bar{z}}^3 - k^4A_{\bar{x}}^4A_{\bar{z}} + 2k^2A_{\bar{x}}^2A_{\bar{z}}^3 - A_{\bar{z}}^5), \\
\delta_{95} &= \frac{3}{2}C_3(A_{\bar{x}}k_{42} + k_{32}(\rho_{21} - \rho_{22}) + \rho_{31}k_{21} + A_{\bar{z}}\rho_{42}), \\
\delta_{96} &= -\frac{3}{8}C_4(-4A_{\bar{x}}^2k_{32} + 8A_{\bar{x}}k_{21}(\rho_{21} - \rho_{22}) + 8A_{\bar{x}}A_{\bar{z}}\rho_{31} - 4A_{\bar{z}}(\rho_{21} - \rho_{22})^2 - k^2A_{\bar{x}}^2k_{32} \\
&\quad - 2kA_{\bar{x}}k_{21}(\sigma_{21} - \sigma_{22}) - 2kA_{\bar{x}}A_{\bar{z}}\sigma_{31} + 3A_{\bar{z}}^2k_{32} - A_{\bar{z}}(\sigma_{21} - \sigma_{22})^2 + 3A_{\bar{z}}k_{21}^2),
\end{aligned}$$

$$\begin{aligned}\delta_{97} = & -\frac{5}{16}C_5(4A_{\bar{x}}^3k_{21} - 12A_{\bar{x}}^2A_{\bar{z}}(\rho_{21} - \rho_{22}) - 9A_{\bar{x}}A_{\bar{z}}^2k_{21} + 3A_{\bar{z}}^3(\rho_{21} - \rho_{22}) + 3k^2A_{\bar{x}}^3k_{21} \\ & + 6kA_{\bar{x}}^2A_{\bar{z}}(\sigma_{21} - \sigma_{22}) - 3k^2A_{\bar{x}}^2A_{\bar{z}}(\rho_{21} - \rho_{22})),\end{aligned}$$

$$\delta_{98} = \frac{15}{128}C_6(8A_{\bar{x}}^4A_{\bar{z}} + 12k^2A_{\bar{x}}^4A_{\bar{z}} - 12A_{\bar{x}}^2A_{\bar{z}}^3 + k^4A_{\bar{x}}^4A_{\bar{z}} - 2k^2A_{\bar{x}}^2A_{\bar{z}}^3 + A_{\bar{z}}^5).$$

$$\rho_{51} = \frac{6n\lambda\beta_9 - (9\lambda^2 + n^2 - C_2)\gamma_8}{(n^2 - 9\lambda^2)^2 + C_2(n^2 - 2C_2 + 9\lambda^2)},$$

$$\rho_{52} = \frac{10n\lambda\beta_{10} - (25\lambda^2 + n^2 - C_2)\gamma_9}{(n^2 - 25\lambda^2)^2 + C_2(n^2 - 2C_2 + 25\lambda^2)},$$

$$\sigma_{51} = -\frac{k\beta_{11}}{2\lambda n},$$

$$\sigma_{52} = \frac{6n\lambda\gamma_8 - (9\lambda^2 + n^2 + 2C_2)\beta_9}{(n^2 - 9\lambda^2)^2 + C_2(n^2 - 2C_2 + 9\lambda^2)},$$

$$\sigma_{53} = \frac{10n\lambda\gamma_9 - (25\lambda^2 + n^2 + 2C_2)\beta_{10}}{(n^2 - 25\lambda^2)^2 + C_2(n^2 - 2C_2 + 25\lambda^2)},$$

$$k_{51} = -\frac{\delta_8}{8\lambda^2},$$

$$k_{52} = -\frac{\delta_9}{24\lambda^2}$$