

|  | $\omega_{1+}^{\#1} \alpha \beta$   | $\omega_{1+}^{\#2} \alpha \beta$ | $f_{1+}^{\#1} \alpha \beta$ | $\omega_{1-}^{\#1} \alpha$                | $\omega_{1-}^{\#2} \alpha$      | $f_{1-}^{\#1} \alpha$ | $f_{1-}^{\#2} \alpha$          |
|--|------------------------------------|----------------------------------|-----------------------------|---|---------------------------------|-----------------------|--------------------------------|
| $\omega_{1+}^{\#1} \dagger^{\alpha \beta}$ | $k^2 (2r_3 + r_5) - \frac{t_1}{2}$ | $-\frac{t_1}{\sqrt{2}}$          | $-\frac{i k t_1}{\sqrt{2}}$ | 0   | 0                               | 0                     | 0                              |
| $\omega_{1+}^{\#2} \dagger^{\alpha \beta}$ | $-\frac{t_1}{\sqrt{2}}$            | 0                                | 0                           | 0   | 0                               | 0                     | 0                              |
| $f_{1+}^{\#1} \dagger^{\alpha \beta}$      | $\frac{i k t_1}{\sqrt{2}}$         | 0                                | 0                           | 0   | 0                               | 0                     | 0                              |
| $\omega_{1-}^{\#1} \dagger^{\alpha}$       | 0                                  | 0                                | 0                           | $k^2 (-r_1 + 2r_3 + r_5) + \frac{t_1}{6}$ | $\frac{t_1}{3\sqrt{2}}$         | 0                     | $\frac{i k t_1}{3}$            |
| $\omega_{1-}^{\#2} \dagger^{\alpha}$       | 0                                  | 0                                | 0                           | $\frac{t_1}{3\sqrt{2}}$                   | $\frac{t_1}{3}$                 | 0                     | $\frac{1}{3} i \sqrt{2} k t_1$ |
| $f_{1-}^{\#1} \dagger^{\alpha}$            | 0                                  | 0                                | 0                           | 0   | 0                               | 0                     | 0                              |
| $f_{1-}^{\#2} \dagger^{\alpha}$            | 0                                  | 0                                | 0                           | $-\frac{1}{3} i k t_1$                    | $-\frac{1}{3} i \sqrt{2} k t_1$ | 0                     | $\frac{2k^2 t_1}{3}$           |

$$\begin{aligned}
& -\frac{1}{3} t_1 \omega_{\alpha}^{\alpha'} \omega_{\kappa\alpha}^{\kappa} - t_1 \omega_{\alpha}^{\kappa\lambda} \omega_{\kappa\lambda}^{\alpha'} + 2 r_1 \partial_{\alpha} \omega_{\kappa}^{\kappa\lambda} \partial^{\alpha} \omega_{\lambda}^{\alpha} - 2 r_3 \partial_{\alpha} \omega_{\kappa}^{\kappa\lambda} \partial^{\alpha} \omega_{\lambda}^{\alpha} - \\
& r_5 \partial_{\alpha} \omega_{\kappa}^{\kappa\lambda} \partial^{\alpha} \omega_{\lambda}^{\alpha} - \frac{2}{3} r_1 \partial^{\beta} \omega_{\kappa}^{\theta\alpha} \partial_{\theta} \omega_{\alpha\beta}^{\kappa} - \frac{2}{3} r_1 \partial_{\theta} \omega_{\alpha\beta}^{\kappa} \partial_{\kappa} \omega^{\alpha\beta\theta} + \\
& \frac{2}{3} r_1 \partial_{\theta} \omega_{\alpha\beta}^{\kappa} \partial_{\kappa} \omega^{\theta\alpha\beta} - 2 r_1 \partial_{\alpha} \omega_{\lambda}^{\alpha} \partial_{\theta} \omega^{\theta\kappa\lambda} + 2 r_3 \partial_{\alpha} \omega_{\lambda}^{\alpha} \partial_{\theta} \omega^{\theta\kappa\lambda} - \\
& r_5 \partial_{\alpha} \omega_{\lambda}^{\alpha} \partial_{\theta} \omega^{\theta\kappa\lambda} + 2 r_1 \partial_{\theta} \omega_{\lambda}^{\alpha} \partial_{\kappa} \omega^{\theta\kappa\lambda} - 2 r_3 \partial_{\theta} \omega_{\lambda}^{\alpha} \partial_{\kappa} \omega^{\theta\kappa\lambda} + \\
& r_5 \partial_{\theta} \omega_{\lambda}^{\alpha} \partial_{\kappa} \omega^{\theta\kappa\lambda} + 2 r_1 \partial_{\alpha} \omega_{\lambda}^{\alpha} \partial_{\kappa} \omega^{\kappa\lambda\theta} - 2 r_3 \partial_{\alpha} \omega_{\lambda}^{\alpha} \partial_{\kappa} \omega^{\kappa\lambda\theta} - \\
& r_5 \partial_{\alpha} \omega_{\lambda}^{\alpha} \partial_{\kappa} \omega^{\kappa\lambda\theta} - 4 r_1 \partial_{\theta} \omega_{\lambda}^{\alpha} \partial_{\kappa} \omega^{\kappa\lambda\theta} + 4 r_3 \partial_{\theta} \omega_{\lambda}^{\alpha} \partial_{\kappa} \omega^{\kappa\lambda\theta} + \\
& 2 r_5 \partial_{\theta} \omega_{\lambda}^{\alpha} \partial_{\kappa} \omega^{\kappa\lambda\theta} - \frac{1}{2} t_1 \partial^{\alpha} f_{\theta\kappa} \partial^{\kappa} f_{\alpha}^{\theta} - \frac{1}{2} t_1 \partial^{\alpha} f_{\kappa\theta} \partial^{\kappa} f_{\alpha}^{\theta} - \\
& \frac{1}{2} t_1 \partial^{\alpha} f_{\kappa}^{\lambda} \partial^{\kappa} f_{\alpha\lambda} + \frac{1}{3} t_1 \omega_{\kappa\alpha}^{\alpha} \partial^{\kappa} f_{\alpha}^{\alpha} + \frac{1}{3} t_1 \omega_{\kappa\lambda}^{\lambda} \partial^{\kappa} f_{\alpha}^{\alpha} + \frac{2}{3} t_1 \partial^{\alpha} f_{\kappa\alpha} \partial^{\kappa} f_{\alpha}^{\alpha} - \\
& \frac{1}{3} t_1 \partial_{\kappa} f_{\alpha}^{\lambda} \partial^{\kappa} f_{\alpha}^{\alpha} + 2 t_1 \omega_{\alpha\kappa\theta} \partial^{\kappa} f_{\alpha}^{\theta} - \frac{1}{3} t_1 \omega_{\alpha}^{\alpha} \partial^{\kappa} f_{\kappa}^{\alpha} - \frac{1}{3} t_1 \omega_{\alpha\lambda}^{\lambda} \partial^{\kappa} f_{\kappa}^{\alpha} + \\
& \frac{1}{2} t_1 \partial^{\alpha} f_{\kappa}^{\lambda} \partial^{\kappa} f_{\alpha\lambda} + \frac{1}{2} t_1 \partial_{\kappa} f_{\alpha}^{\lambda} \partial^{\kappa} f_{\alpha}^{\theta} + \frac{1}{2} t_1 \partial_{\kappa} f_{\alpha}^{\lambda} \partial^{\kappa} f_{\alpha}^{\theta} - \\
& \frac{1}{3} t_1 \partial^{\alpha} f_{\alpha}^{\lambda} \partial^{\kappa} f_{\lambda\kappa} + \frac{2}{3} r_1 \partial_{\kappa} \omega^{\alpha\beta\theta} \partial^{\kappa} \omega_{\alpha\beta\theta} - \frac{2}{3} r_1 \partial_{\kappa} \omega^{\theta\alpha\beta} \partial^{\kappa} \omega_{\alpha\beta\theta} + \\
& \frac{2}{3} r_1 \partial^{\beta} \omega_{\alpha}^{\alpha\lambda} \partial_{\lambda} \omega_{\alpha\beta}^{\alpha} + \frac{4}{3} r_1 \partial^{\beta} \omega_{\alpha}^{\lambda\alpha} \partial_{\lambda} \omega_{\alpha\beta}^{\alpha} - 4 r_3 \partial^{\beta} \omega_{\alpha}^{\lambda\alpha} \partial_{\lambda} \omega_{\alpha\beta}^{\alpha} + \\
& 2 r_1 \partial_{\alpha} \omega_{\lambda}^{\alpha} \partial^{\lambda} \omega_{\kappa}^{\theta\kappa} - 2 r_3 \partial_{\alpha} \omega_{\lambda}^{\alpha} \partial^{\lambda} \omega_{\kappa}^{\theta\kappa} + r_5 \partial_{\alpha} \omega_{\lambda}^{\alpha} \partial^{\lambda} \omega_{\kappa}^{\theta\kappa} - \\
& 2 r_1 \partial_{\theta} \omega_{\lambda}^{\alpha} \partial^{\lambda} \omega_{\kappa}^{\theta\kappa} + 2 r_3 \partial_{\theta} \omega_{\lambda}^{\alpha} \partial^{\lambda} \omega_{\kappa}^{\theta\kappa} - r_5 \partial_{\theta} \omega_{\lambda}^{\alpha} \partial^{\lambda} \omega_{\kappa}^{\theta\kappa}
\end{aligned}$$

|                         | $\omega_0^{\#1}$   | $f_0^{\#1}$ | $f_0^{\#2}$ | $\omega_0^{\#1}$ |
|-------------------------|--------------------|-------------|-------------|------------------|
| $\omega_0^{\#1} \vdash$ | $6k^2(-r_1 + r_3)$ | 0           | 0           | 0                |
| $f_0^{\#1} \vdash$      | 0                  | 0           | 0           | 0                |
| $f_0^{\#2} \vdash$      | 0                  | 0           | 0           | 0                |
| $\omega_0^{\#1} \vdash$ | 0                  | 0           | 0           | $-t_1$           |

$$\begin{array}{ccc}
 \omega_{2^+}^{\#1} \alpha \beta & f_{2^+}^{\#1} \alpha \beta & \omega_{2^-}^{\#1} \alpha \beta \chi \\
 \omega_{2^+}^{\#1} \dagger \alpha \beta & \frac{t_1}{2} & -\frac{i k t_1}{\sqrt{2}} & 0 \\
 f_{2^+}^{\#1} \dagger \alpha \beta & \frac{i k t_1}{\sqrt{2}} & k^2 t_1 & 0 \\
 \omega_{2^-}^{\#1} \dagger \alpha \beta \chi & 0 & 0 & k^2 r_1 + \frac{t_1}{2}
 \end{array}$$
