The contribution of diagram (a) is given by

$$M = \frac{(-ig_W)^2}{8} \bar{v}(p_+) \not{\varepsilon}(q_+)(1-\gamma_5) \frac{i}{\not{p}_- - \not{q}_-} \not{\varepsilon}(q_-)(1-\gamma_5) u(p_-) \ . \tag{8.114}$$

Inserting the leading term for the polarizations from Eq. (8.113) and dropping non-leading terms, we obtain

$$M = -i \frac{(-ig_W)^2}{8M_W^2} \bar{v}(p_+)(\not{q}_+ - \not{q}_-)(1-\gamma_5) u(p_-) \ . \tag{8.115}$$

The contribution of the photon exchange diagram (b), using the Feynman rules of Figs. 8.2(updated) and 8.5, is

$$\begin{aligned} M &= (-ig_W)^2 Q_e \sin^2\theta_W \bar{v}(p_+)\gamma^\rho u(p_-) \frac{-ig_{\rho\alpha}}{(q_+ + q_-)^2} \\ &\times V^{\beta\delta\alpha}(-q_+, -q_-, q_+ + q_-)\varepsilon_\beta(q_+)\varepsilon_\delta(q_-) \ . \end{aligned} \tag{8.116}$$

The contribution of the Z exchange diagram (c) is

$$\begin{aligned} M &= \frac{(-ig_W)^2}{2} \bar{v}(p_+)\gamma^\rho (V_e - A_e\gamma_5) u(p_-) \frac{-ig_{\rho\alpha}}{(q_+ + q_-)^2 - M_Z^2} \\ &\times V^{\beta\delta\alpha}(-q_+, -q_-, q_+ + q_-)\varepsilon_\beta(q_+)\varepsilon_\delta(q_-) \ . \end{aligned} \tag{8.117}$$

where

$$V^{\beta\delta\alpha}(p,q,r) = g^{\beta\delta}(p^\alpha - q^\alpha) + g^{\delta\alpha}(q^\beta - r^\beta) + g^{\alpha\beta}(r^\delta - p^\delta) \ . \tag{8.118}$$

Hence we find, using the approximate longitudinal polarization vector of Eq. (8.113),

$$\begin{aligned} & V^{\beta\delta\alpha}(-q_+, -q_-, q_+ + q_-)\varepsilon_\beta(q_+)\varepsilon_\delta(q_-) \\ &= \frac{(q_+ + q_-)^2}{2M_W^2}\left[q_+^\alpha - q_-^\alpha\right] + O(1) \ . \end{aligned} \tag{8.119}$$

The result for the sum of the Z and γ exchange contributions, after inserting the values for V_e and A_e, is

$$M = i\frac{(-ig_W)^2}{8M_W^2} \bar{v}(p_+)(\not{q}_+ - \not{q}_-)(1-\gamma_5) u(p_-) \ , \tag{8.120}$$

which cancels exactly with Eq. (7.115). So we see that the leading high-energy behaviour is cancelled, as a result of the relationship between the three-boson couplings and the couplings to fermions imposed by the gauge structure.