$$
\begin{aligned}
&\frac{\theta_p(pq^2t^2A^{-2}B^2)\theta_p\big((pq)^{-1}q^{-1}t^{-4}A^2B^{-2}\big)}{\theta_p\big(t^{-2}\big)\theta_p\big(q^{-1}t^{-2}B^{-2}\big)\theta_p\big(q^{-1}t^{-2}A^2\big)\theta_p\big(pq^2t^4A^{-2}B^2\big)\theta_p\big(q^{-1}t^{-2}AB^{-1}C^{\pm1}D^{\pm1}\big)}\\
&\times\frac{\theta_p\big((pq)^{\frac12}q^{-1}tB^{-1}z^{-1}D^{\pm1}\big)\theta_p\big((pq)^{\frac12}q^{-1}tAz^{-1}C^{\pm1}\big)\Gamma_e\big((pq)^{\frac12}q^{\frac12}tBD^{\pm1}\big(q^{\frac12}z\big)^{\pm1}\big)}{\theta_p\big(t^{-4}z^2\big)\theta\big(z^2\big)}\\
&\times\frac{\Gamma_e\big((pq)^{\frac12}q^{\frac12}tA^{-1}C^{\pm1}\big(q^{\frac12}z\big)^{\pm1}\big)\Gamma_e\big((qp)^{\frac12}t^{-1}A^{\pm1}C^{\pm1}z^{\pm1}\big)\Gamma_e\big((qp)^{\frac12}t^{-1}B^{\pm1}D^{\pm1}z^{\pm1}\big)}{\Gamma\big(z^{\pm2}\big)}\\
&\times\Gamma_e\big((qp)^{\frac12}tB^{-1}D^{\pm1}z^{\pm1}\big)\Gamma_e\big((qp)^{\frac12}tAC^{\pm1}z^{\pm1}\big)\Gamma_e\big(q^{-1}A^2B^{-2}\big)\Gamma_e\big(pq^2t^4\big)\Gamma_e\big(t^{-4}A^2B^{-2}z^2\big)\\
&\qquad\times\Gamma_e\big(zz^{\pm1}\big)\Gamma_e\big(pqt^4z^{-2}\big)\Gamma_e\big(q^{-1}t^{-4}A^2B{-}2\big)\Gamma_e\big(q^{-1}z^{-1}z^{\pm1}\big)\\
&\qquad\times\Gamma_e\big(pq^2\big)\Gamma_e\big(pq^2t^4A^{-2}B^2z^{-1}z^{\pm1}\big)\Gamma_e\big(t^{-4}zz^{\pm1}\big)\Gamma_e\big(A^{-2}B^2\big)T_{\mathfrak{J}_D}(z)\\
&+\frac{\theta_p\big(pq^2t^2A^{-2}B^2\big)\theta_p\big((pq)^{-1}q^{-1}t^{-4}A^2B^{-2}\big)}{\theta_p\big(t^{-2}\big)\theta_p\big(q^{-1}t^{-2}B^{-2}\big)\theta_p\big(q^{-1}t^{-2}A^2\big)\theta_p\big(pq^2t^4A^{-2}B^2\big)\theta_p\big(q^{-1}t^{-2}AB^{-1}C^{\pm1}D^{\pm1}\big)}\\
&\times\frac{\theta_p\big((pq)^{\frac12}q^{-1}tB^{-1}z^{-1}D^{\pm1}\big)\theta_p\big((pq)^{\frac12}q^{-1}tAz^{-1}C^{\pm1}\big)\Gamma_e\big((pq)^{\frac12}q^{\frac12}tBD^{\pm1}\big(q^{\frac12}z\big)^{\pm1}\big)}{\theta_p\big(t^{-4}z^2\big)\theta\big(z^2\big)}\\
&\times\frac{\Gamma_e\big((pq)^{\frac12}q^{\frac12}tA^{-1}C^{\pm1}\big(q^{\frac12}z\big)^{\pm1}\big)\Gamma_e\big((qp)^{\frac12}t^{-1}A^{\pm1}C^{\pm1}(qz)^{\pm1}\big)\Gamma_e\big((qp)^{\frac12}t^{-1}B^{\pm1}D^{\pm1}(qz)^{\pm1}\big)}{\Gamma\big((qz)^{\pm2}\big)}\\
&\qquad\times\Gamma_e\big((qp)^{\frac12}tB^{-1}D^{\pm1}(qz)^{\pm1}\big)\Gamma_e\big((qp)^{\frac12}tAC^{\pm1}(qz)^{\pm1}\big)\Gamma_e\big(q^{-1}A^2B^{-2}\big)\\
&\times\Gamma_e\big(pq^2t^4\big)\Gamma_e\big(t^{-4}A^2B^{-2}z^2\big)\Gamma_e\big(z(qz)^{\pm1}\big)\Gamma_e\big(pqt^4z^{-2}\big)\Gamma_e\big(q^{-1}t^{-4}A^2B^{-2}\big)\Gamma_e\big((qz)^{-1}(qz)^{\pm1}\big)\\
&\times\Gamma_e\big(pq^2\big)\Gamma_e\big(pq^2t^4A^{-2}B^2z^{-1}(qz)^{\pm1}\big)\Gamma_e\big(t^{-4}z(qz)^{\pm1}\big)\Gamma_e\big(A^{-2}B^2\big)T_{\mathfrak{J}_D}(qz)+\big\{z\leftrightarrow z^{-1}\big\},
\end{aligned}
$$

which simplifies to

$$
\begin{aligned}
&\frac{\theta_p\big(pq^2t^2A^{-2}B^2\big)\theta_p\big((pq)^{-1}q^{-1}t^{-4}A^2B^{-2}\big)\Gamma_e\big(q^{-1}A^2B^{-2}\big)\Gamma_e\big(A^{-2}B^2\big)}{\theta_p\big(t^{-2}\big)\theta_p\big(q^{-1}t^{-2}B^{-2}\big)\theta_p\big(q^{-1}t^{-2}A^2\big)\theta_p\big(pq^2t^4A^{-2}B^2\big)\theta_p\big(q^{-1}t^{-2}AB^{-1}C^{\pm1}D^{\pm1}\big)}\\
&\quad\times\frac{\theta_p\big((pq)^{\frac12}t^{\pm1}BD^{\pm1}z\big)\theta_p\big((pq)^{\frac12}t^{\pm1}A^{-1}C^{\pm1}z\big)\theta_p\big(q^{-1}t^{-4}\big)\theta_p\big(q^{-1}t^{-4}A^2B^{-2}z^2\big)}{\theta_p\big(t^{-4}z^2\big)\theta_p\big(z^2\big)\theta_p\big(q^{-1}z^2\big)}T_{\mathfrak{J}_D}(z)\\
&\qquad+\frac{\theta_p\big(pq^2t^2A^{-2}B^2\big)\theta_p\big((pq)^{-1}q^{-1}t^{-4}A^2B^{-2}\big)\Gamma_e\big(q^{-1}A^2B^{-2}\big)\Gamma_e\big(A^{-2}B^2\big)}{\theta_p\big(t^{-2}\big)\theta_p\big(q^{-1}t^{-2}B^{-2}\big)\theta_p\big(q^{-1}t^{-2}A^2\big)\theta_p\big(q^{-1}t^{-2}AB^{-1}C^{\pm1}D^{\pm1}\big)}\\
&\qquad\times\frac{\theta_p\big((pq)^{\frac12}t^{-1}B^{\pm1}D^{\pm1}z\big)\theta_p\big((pq)^{\frac12}t^{-1}A^{\pm1}C^{\pm1}z\big)}{\theta_p\big(qz^2\big)\theta\big(z^2\big)}T_{\mathfrak{J}_D}(qz)+\big\{z\leftrightarrow z^{-1}\big\}.
\end{aligned}
$$