General Gauge:

$$\eta^{\alpha\beta}\ \partial_\alpha h_{\beta\nu} == \eta^{\alpha\beta}\ \left(\frac{J\ h_{\alpha\nu}\ \partial_\beta\Omega}{\Omega} + P\ \partial_\nu h_{\alpha\beta} + \frac{Q\ h_{\alpha\beta}\ \partial_\nu\Omega}{\Omega}\right)$$

Ω[t] RW

Arbitrary J, P, Q

00	$-\frac{\partial_0\partial_0 h_{00}}{2\Omega[t]^2}-\frac{1}{2}P\,\partial_0\partial_0 h+\frac{\partial_1\partial_1 h_{00}}{2\Omega[t]^2}+\frac{\partial_1\partial_1 h}{2}-\frac{1}{2}P\,\partial_1\partial_1 h+\frac{\partial_2\partial_2 h_{00}}{2\Omega[t]^2}+\frac{\partial_2\partial_2 h}{2}-\frac{1}{2}P\,\partial_2\partial_2 h+\frac{\partial_3\partial_3 h_{00}}{2\Omega[t]^2}+\frac{\partial_3\partial_3 h}{2}-\frac{1}{2}P\,\partial_3\partial_3 h+\frac{\partial_0 h_{00}\,\Omega'[t]}{\Omega[t]^3}+\frac{J\,\partial_0 h_{00}\,\Omega'[t]}{\Omega[t]^3}-\frac{\partial_0 h\,\Omega'[t]}{\Omega[t]}+\frac{J P\,\partial_0 h\,\Omega'[t]}{2\Omega[t]}-\frac{Q\,\partial_0 h\,\Omega'[t]}{2\Omega[t]}+\frac{2h_{00}\,\Omega'[t]^2}{\Omega[t]^4}-\frac{5J h_{00}\,\Omega'[t]^2}{2\Omega[t]^4}-\frac{J^2 h_{00}\,\Omega'[t]^2}{2\Omega[t]^4}+\frac{3P h\,\Omega'[t]^2}{\Omega[t]^2}+\frac{J P h\,\Omega'[t]^2}{\Omega[t]^2}+\frac{3Q h\,\Omega'[t]^2}{2\Omega[t]^2}+\frac{J Q h\,\Omega'[t]^2}{2\Omega[t]^2}+\frac{J h_{00}\,\Omega''[t]}{2\Omega[t]^3}-\frac{P h\,\Omega''[t]}{\Omega[t]}-\frac{Q h\,\Omega''[t]}{2\Omega[t]}$
11	$-\frac{\partial_0\partial_0 h_{11}}{2\Omega[t]^2}+\frac{\partial_0\partial_0 h}{2}-\frac{1}{2}P\,\partial_0\partial_0 h+\frac{\partial_1\partial_1 h_{11}}{2\Omega[t]^2}-\frac{1}{2}P\,\partial_1\partial_1 h+\frac{\partial_2\partial_2 h_{11}}{2\Omega[t]^2}-\frac{\partial_2\partial_2 h}{2}+\frac{1}{2}P\,\partial_2\partial_2 h+\frac{\partial_3\partial_3 h_{11}}{2\Omega[t]^2}-\frac{\partial_3\partial_3 h}{2}+\frac{1}{2}P\,\partial_3\partial_3 h+\frac{\partial_0 h_{11}\,\Omega'[t]}{\Omega[t]^3}+\frac{\partial_0 h\,\Omega'[t]}{\Omega[t]}-\frac{2P\,\partial_0 h\,\Omega'[t]}{\Omega[t]}-\frac{J P\,\partial_0 h\,\Omega'[t]}{2\Omega[t]}-\frac{Q\,\partial_0 h\,\Omega'[t]}{2\Omega[t]}+\frac{J\,\partial_1 h_{01}\,\Omega'[t]}{\Omega[t]^3}-\frac{2h_{00}\,\Omega'[t]^2}{\Omega[t]^4}-\frac{J h_{00}\,\Omega'[t]^2}{2\Omega[t]^4}+\frac{J^2 h_{00}\,\Omega'[t]^2}{2\Omega[t]^4}-\frac{2h_{11}\,\Omega'[t]^2}{\Omega[t]^4}-\frac{P h\,\Omega'[t]^2}{\Omega[t]^2}-\frac{J P h\,\Omega'[t]^2}{\Omega[t]^2}-\frac{Q h\,\Omega'[t]^2}{2\Omega[t]^2}-\frac{J Q h\,\Omega'[t]^2}{2\Omega[t]^2}+\frac{h_{00}\,\Omega''[t]}{\Omega[t]^3}+\frac{J h_{00}\,\Omega''[t]}{2\Omega[t]^3}+\frac{3h_{11}\,\Omega''[t]}{\Omega[t]^3}-\frac{P h\,\Omega''[t]}{\Omega[t]}-\frac{Q h\,\Omega''[t]}{2\Omega[t]}$
22	$-\frac{\partial_0\partial_0 h_{22}}{2\Omega[t]^2}+\frac{\partial_0\partial_0 h}{2}-\frac{1}{2}P\,\partial_0\partial_0 h+\frac{\partial_1\partial_1 h_{22}}{2\Omega[t]^2}-\frac{\partial_1\partial_1 h}{2}+\frac{1}{2}P\,\partial_1\partial_1 h+\frac{\partial_2\partial_2 h_{22}}{2\Omega[t]^2}-\frac{1}{2}P\,\partial_2\partial_2 h+\frac{\partial_3\partial_3 h_{22}}{2\Omega[t]^2}-\frac{\partial_3\partial_3 h}{2}+\frac{1}{2}P\,\partial_3\partial_3 h+\frac{\partial_0 h_{22}\,\Omega'[t]}{\Omega[t]^3}+\frac{\partial_0 h\,\Omega'[t]}{\Omega[t]}-\frac{2P\,\partial_0 h\,\Omega'[t]}{\Omega[t]}-\frac{J P\,\partial_0 h\,\Omega'[t]}{2\Omega[t]}-\frac{Q\,\partial_0 h\,\Omega'[t]}{2\Omega[t]}+\frac{J\,\partial_2 h_{02}\,\Omega'[t]}{\Omega[t]^3}-\frac{2h_{00}\,\Omega'[t]^2}{\Omega[t]^4}-\frac{J h_{00}\,\Omega'[t]^2}{2\Omega[t]^4}+\frac{J^2 h_{00}\,\Omega'[t]^2}{2\Omega[t]^4}-\frac{2h_{22}\,\Omega'[t]^2}{\Omega[t]^4}-\frac{P h\,\Omega'[t]^2}{\Omega[t]^2}-\frac{J P h\,\Omega'[t]^2}{\Omega[t]^2}-\frac{Q h\,\Omega'[t]^2}{2\Omega[t]^2}-\frac{J Q h\,\Omega'[t]^2}{2\Omega[t]^2}+\frac{h_{00}\,\Omega''[t]}{\Omega[t]^3}+\frac{J h_{00}\,\Omega''[t]}{2\Omega[t]^3}+\frac{3h_{22}\,\Omega''[t]}{\Omega[t]^3}-\frac{P h\,\Omega''[t]}{\Omega[t]}-\frac{Q h\,\Omega''[t]}{2\Omega[t]}$
33	$-\frac{\partial_0\partial_0 h_{33}}{2\Omega[t]^2}+\frac{\partial_0\partial_0 h}{2}-\frac{1}{2}P\,\partial_0\partial_0 h+\frac{\partial_1\partial_1 h_{33}}{2\Omega[t]^2}-\frac{\partial_1\partial_1 h}{2}+\frac{1}{2}P\,\partial_1\partial_1 h+\frac{\partial_2\partial_2 h_{33}}{2\Omega[t]^2}-\frac{\partial_2\partial_2 h}{2}+\frac{1}{2}P\,\partial_2\partial_2 h+\frac{\partial_3\partial_3 h_{33}}{2\Omega[t]^2}-\frac{1}{2}P\,\partial_3\partial_3 h+\frac{\partial_0 h_{33}\,\Omega'[t]}{\Omega[t]^3}+\frac{\partial_0 h\,\Omega'[t]}{\Omega[t]}-\frac{2P\,\partial_0 h\,\Omega'[t]}{\Omega[t]}-\frac{J P\,\partial_0 h\,\Omega'[t]}{2\Omega[t]}-\frac{Q\,\partial_0 h\,\Omega'[t]}{2\Omega[t]}+\frac{J\,\partial_3 h_{03}\,\Omega'[t]}{\Omega[t]^3}-\frac{2h_{00}\,\Omega'[t]^2}{\Omega[t]^4}-\frac{J h_{00}\,\Omega'[t]^2}{2\Omega[t]^4}+\frac{J^2 h_{00}\,\Omega'[t]^2}{2\Omega[t]^4}-\frac{2h_{33}\,\Omega'[t]^2}{\Omega[t]^4}-\frac{P h\,\Omega'[t]^2}{\Omega[t]^2}-\frac{J P h\,\Omega'[t]^2}{\Omega[t]^2}-\frac{Q h\,\Omega'[t]^2}{2\Omega[t]^2}-\frac{J Q h\,\Omega'[t]^2}{2\Omega[t]^2}+\frac{h_{00}\,\Omega''[t]}{\Omega[t]^3}+\frac{J h_{00}\,\Omega''[t]}{2\Omega[t]^3}+\frac{3h_{33}\,\Omega''[t]}{\Omega[t]^3}-\frac{P h\,\Omega''[t]}{\Omega[t]}-\frac{Q h\,\Omega''[t]}{2\Omega[t]}$
01	$-\frac{\partial_0\partial_0 h_{01}}{2\Omega[t]^2}+\frac{\partial_0\partial_1 h}{2}-P\,\partial_0\partial_1 h+\frac{\partial_1\partial_1 h_{01}}{2\Omega[t]^2}+\frac{\partial_2\partial_2 h_{01}}{2\Omega[t]^2}+\frac{\partial_3\partial_3 h_{01}}{2\Omega[t]^2}+\frac{\partial_0 h_{01}\,\Omega'[t]}{\Omega[t]^3}+\frac{J\,\partial_0 h_{01}\,\Omega'[t]}{2\Omega[t]^3}+\frac{J\,\partial_1 h_{00}\,\Omega'[t]}{2\Omega[t]^3}-\frac{P\,\partial_1 h\,\Omega'[t]}{\Omega[t]}-\frac{Q\,\partial_1 h\,\Omega'[t]}{2\Omega[t]}-\frac{h_{01}\,\Omega'[t]^2}{\Omega[t]^4}-\frac{3J h_{01}\,\Omega'[t]^2}{2\Omega[t]^4}+\frac{2h_{01}\,\Omega''[t]}{\Omega[t]^3}+\frac{J h_{01}\,\Omega''[t]}{2\Omega[t]^3}$
02	$-\frac{\partial_0\partial_0 h_{02}}{2\Omega[t]^2}+\frac{\partial_0\partial_2 h}{2}-P\,\partial_0\partial_2 h+\frac{\partial_1\partial_1 h_{02}}{2\Omega[t]^2}+\frac{\partial_2\partial_2 h_{02}}{2\Omega[t]^2}+\frac{\partial_3\partial_3 h_{02}}{2\Omega[t]^2}+\frac{\partial_0 h_{02}\,\Omega'[t]}{\Omega[t]^3}+\frac{J\,\partial_0 h_{02}\,\Omega'[t]}{2\Omega[t]^3}+\frac{J\,\partial_2 h_{00}\,\Omega'[t]}{2\Omega[t]^3}-\frac{P\,\partial_2 h\,\Omega'[t]}{\Omega[t]}-\frac{Q\,\partial_2 h\,\Omega'[t]}{2\Omega[t]}-\frac{h_{02}\,\Omega'[t]^2}{\Omega[t]^4}-\frac{3J h_{02}\,\Omega'[t]^2}{2\Omega[t]^4}+\frac{2h_{02}\,\Omega''[t]}{\Omega[t]^3}+\frac{J h_{02}\,\Omega''[t]}{2\Omega[t]^3}$
03	$-\frac{\partial_0\partial_0 h_{03}}{2\Omega[t]^2}+\frac{\partial_0\partial_3 h}{2}-P\,\partial_0\partial_3 h+\frac{\partial_1\partial_1 h_{03}}{2\Omega[t]^2}+\frac{\partial_2\partial_2 h_{03}}{2\Omega[t]^2}+\frac{\partial_3\partial_3 h_{03}}{2\Omega[t]^2}+\frac{\partial_0 h_{03}\,\Omega'[t]}{\Omega[t]^3}+\frac{J\,\partial_0 h_{03}\,\Omega'[t]}{2\Omega[t]^3}+\frac{J\,\partial_3 h_{00}\,\Omega'[t]}{2\Omega[t]^3}-\frac{P\,\partial_3 h\,\Omega'[t]}{\Omega[t]}-\frac{Q\,\partial_3 h\,\Omega'[t]}{2\Omega[t]}-\frac{h_{03}\,\Omega'[t]^2}{\Omega[t]^4}-\frac{3J h_{03}\,\Omega'[t]^2}{2\Omega[t]^4}+\frac{2h_{03}\,\Omega''[t]}{\Omega[t]^3}+\frac{J h_{03}\,\Omega''[t]}{2\Omega[t]^3}$
12	$-\frac{\partial_0\partial_0 h_{12}}{2\Omega[t]^2}+\frac{\partial_1\partial_1 h_{12}}{2\Omega[t]^2}+\frac{\partial_1\partial_2 h}{2}-P\,\partial_1\partial_2 h+\frac{\partial_2\partial_2 h_{12}}{2\Omega[t]^2}+\frac{\partial_3\partial_3 h_{12}}{2\Omega[t]^2}+\frac{\partial_0 h_{12}\,\Omega'[t]}{\Omega[t]^3}+\frac{J\,\partial_1 h_{02}\,\Omega'[t]}{2\Omega[t]^3}+\frac{J\,\partial_2 h_{01}\,\Omega'[t]}{2\Omega[t]^3}-\frac{2h_{12}\,\Omega'[t]^2}{\Omega[t]^4}+\frac{3h_{12}\,\Omega''[t]}{\Omega[t]^3}$
13	$-\frac{\partial_0\partial_0 h_{13}}{2\Omega[t]^2}+\frac{\partial_1\partial_1 h_{13}}{2\Omega[t]^2}+\frac{\partial_1\partial_3 h}{2}-P\,\partial_1\partial_3 h+\frac{\partial_2\partial_2 h_{13}}{2\Omega[t]^2}+\frac{\partial_3\partial_3 h_{13}}{2\Omega[t]^2}+\frac{\partial_0 h_{13}\,\Omega'[t]}{\Omega[t]^3}+\frac{J\,\partial_1 h_{03}\,\Omega'[t]}{2\Omega[t]^3}+\frac{J\,\partial_3 h_{01}\,\Omega'[t]}{2\Omega[t]^3}-\frac{2h_{13}\,\Omega'[t]^2}{\Omega[t]^4}+\frac{3h_{13}\,\Omega''[t]}{\Omega[t]^3}$
23	$-\frac{\partial_0\partial_0 h_{23}}{2\Omega[t]^2}+\frac{\partial_1\partial_1 h_{23}}{2\Omega[t]^2}+\frac{\partial_2\partial_2 h_{23}}{2\Omega[t]^2}+\frac{\partial_2\partial_3 h}{2}-P\,\partial_2\partial_3 h+\frac{\partial_3\partial_3 h_{23}}{2\Omega[t]^2}+\frac{\partial_0 h_{23}\,\Omega'[t]}{\Omega[t]^3}+\frac{J\,\partial_2 h_{03}\,\Omega'[t]}{2\Omega[t]^3}+\frac{J\,\partial_3 h_{02}\,\Omega'[t]}{2\Omega[t]^3}-\frac{2h_{23}\,\Omega'[t]^2}{\Omega[t]^4}+\frac{3h_{23}\,\Omega''[t]}{\Omega[t]^3}$

Conditions required for diagonalization (up to trace) of spatial components

ii	$\frac{J\,\partial_i h_{0i}\,\Omega'[t]}{\Omega[t]^3}-\frac{2h_{00}\,\Omega'[t]^2}{\Omega[t]^4}-\frac{J h_{00}\,\Omega'[t]^2}{2\Omega[t]^4}+\frac{J^2 h_{00}\,\Omega'[t]^2}{2\Omega[t]^4}+\frac{h_{00}\,\Omega''[t]}{\Omega[t]^3}+\frac{J h_{00}\,\Omega''[t]}{2\Omega[t]^3}$

ij, i≠j	$\frac{J\,\partial_i h_{0j}\,\Omega'[t]}{2\Omega[t]^3}+\frac{J\,\partial_j h_{0i}\,\Omega'[t]}{2\Omega[t]^3}$

and time-space component

0i	$\frac{J\,\partial_i h_{00}\,\Omega'[t]}{2\,\Omega[t]^3}$

For J = 0,

ii, J=0	$-\frac{2\,h_{00}\,\Omega'[t]^2}{\Omega[t]^4}+\frac{h_{00}\,\Omega''[t]}{\Omega[t]^3}$

$2\Omega'[t]^2 = \Omega[t]\Omega''[t]$

with solution

$\Omega[t] = \frac{A}{t+B}$.