$$\Gamma^1_{33} = -\frac{1}{2g_{11}}\frac{\partial g_{33}}{\partial x^1} = -\frac{1}{2(-e^{\mu})}\frac{\partial}{\partial r}\left(-e^{\mu} r^2 \sin^2\theta\right)$$

$$= -\frac{1}{2e^{\mu}}\left(e^{\mu} 2r + e^{\mu}\mu' r^2\right)\sin^2\theta$$

$$= -\left(r + \frac{1}{2}\mu' r^2\right)\sin^2\theta$$

$$\Gamma^2_{33} = -\frac{1}{2g_{22}}\frac{\partial g_{33}}{\partial x^2}$$

$$= -\frac{1}{2(-e^{\mu}r^2)}\frac{\partial}{\partial \theta}\left(-e^{\mu} r^2 \sin^2\theta\right)$$

$$= -\frac{1}{2e^{\mu}r^2}\, e^{\mu} r^2 \,.\, 2\sin\theta\cos\theta$$

$$= -\sin\theta\cos\theta$$

$$\Gamma^4_{33} = -\frac{1}{2g_{44}}\frac{\partial g_{33}}{\partial x^4} = -\frac{1}{2}\frac{\partial}{\partial t}\left(-e^{\mu} r^2 \sin^2\theta\right)$$

$$= \frac{1}{2}\dot{g}\, e^{\mu} r^2 \sin^2\theta$$

And the rest all zero.

Ricci tensors are given by

$$R_{ij} = -\frac{\partial \Gamma^{\alpha}_{ij}}{\partial x^{\alpha}} + \frac{\partial \Gamma^{\alpha}_{i\alpha}}{\partial x^{j}} - \Gamma^{\beta}_{ij}\Gamma^{\alpha}_{\beta\alpha} + \Gamma^{\beta}_{i\alpha}\Gamma^{\alpha}_{\beta j}$$

$$\therefore\quad R_{11} = -\frac{\partial \Gamma^{\alpha}_{11}}{\partial x^{\alpha}} + \frac{\partial \Gamma^{\alpha}_{1\alpha}}{\partial x^{1}} - \Gamma^{\beta}_{11}\Gamma^{\alpha}_{\beta\alpha} + \Gamma^{\beta}_{1\alpha}\Gamma^{\alpha}_{\beta 1}$$

$$= -\frac{\partial \Gamma^1_{11}}{\partial x^1} - \frac{\partial \Gamma^4_{11}}{\partial x^4} + \frac{\partial}{\partial x^1}\left(\Gamma^1_{11} + \Gamma^2_{12} + \Gamma^3_{13}\right)$$

$$- \Gamma^1_{11}\left(\Gamma^1_{11} + \Gamma^2_{32} + \Gamma^3_{13}\right) - \Gamma^4_{11}\left(\Gamma^1_{41} + \Gamma^2_{42} + \Gamma^3_{43}\right)$$

$$+ \Gamma^1_{11}\Gamma^1_{11} + \Gamma^4_{11}\Gamma^1_{41} + \Gamma^1_{14}\Gamma^4_{11} + \Gamma^2_{12}\Gamma^2_{12} + \Gamma^3_{13}\Gamma^3_{13}$$

$$= -\frac{\partial \Gamma^4_{11}}{\partial x^4} + \frac{\partial}{\partial x^1}\left(\Gamma^2_{12} + \Gamma^3_{13}\right) - \Gamma^1_{11}\left(\Gamma^2_{12} + \Gamma^3_{13}\right)$$

$$- \Gamma^4_{11}\left(\Gamma^2_{42} + \Gamma^3_{43}\right) + \Gamma^1_{14}\Gamma^4_{11} + \Gamma^2_{12}\Gamma^2_{12} + \Gamma^3_{13}\Gamma^3_{13}$$

$$= -\frac{\partial}{\partial t}\left(\frac{1}{2}\dot{g}e^{\mu}\right) + \frac{\partial}{\partial r}\left\{\left(\frac{1}{r} + \frac{1}{2}f'\right) + \left(\frac{1}{r} + \frac{1}{2}f'\right)\right\}$$

$$-\frac{1}{2}f'\left\{\left(\frac{1}{r} + \frac{1}{2}f'\right) + \left(\frac{1}{r} + \frac{1}{2}f'\right)\right\}$$

$$-\frac{1}{2}\dot{g}e^{\mu}\left\{\frac{1}{2}\dot{g} + \frac{1}{2}\dot{g}\right\} + \frac{1}{2}\dot{g}\left(\frac{1}{2}\dot{g}e^{\mu}\right)$$

$$+\left(\frac{1}{r} + \frac{1}{2}f'\right)\left(\frac{1}{r} + \frac{1}{2}f'\right) + \left(\frac{1}{r} + \frac{1}{2}f'\right)\left(\frac{1}{r} + \frac{1}{2}f'\right)$$

$$= -\frac{1}{2}\ddot{g}e^{\mu} - \frac{1}{2}\dot{g}^2e^{\mu} - \frac{2}{r^2} + f'' - \frac{f'}{r}$$

$$-\frac{1}{2}f'^2 - \frac{1}{2}\dot{g}^2e^{\mu} + \frac{1}{4}\dot{g}^2e^{\mu} + \frac{2}{r^2} + 2\frac{f'}{r}$$

$$+\frac{1}{2}f'^2.$$

$$= -\frac{1}{2}\ddot{g}e^{\mu} - \frac{3}{4}\dot{g}^2e^{\mu} + f'' + \frac{f'}{r}$$

$$= f'' + \frac{f'}{r} - e^{\mu}\left(\frac{1}{2}\ddot{g} + \frac{3}{4}\dot{g}^2\right).$$

$$R_{22} = -\frac{\partial\Gamma^{\alpha}_{22}}{\partial x^{\alpha}} + \frac{\partial\Gamma^{\alpha}_{2\alpha}}{\partial x^2} - \Gamma^{\beta}_{22}\Gamma^{\alpha}_{\beta\alpha} + \Gamma^{\beta}_{2\alpha}\Gamma^{\alpha}_{\beta 2}$$

$$= -\frac{\partial\Gamma^{1}_{22}}{\partial x^1} - \frac{\partial\Gamma^{4}_{22}}{\partial x^4} + \frac{\partial\Gamma^{3}_{23}}{\partial x^2} - \Gamma^{1}_{22}\left(\Gamma^{1}_{11} + \Gamma^{2}_{12} + \Gamma^{3}_{13}\right)$$

$$-\Gamma^{4}_{22}\left(\Gamma^{1}_{41} + \Gamma^{2}_{42} + \Gamma^{3}_{43}\right) + \Gamma^{2}_{21}\Gamma^{1}_{22}$$

$$+\Gamma^{1}_{22}\Gamma^{2}_{12} + \Gamma^{4}_{22}\Gamma^{2}_{42} + \Gamma^{2}_{24}\Gamma^{4}_{22} + \Gamma^{3}_{23}\Gamma^{3}_{23}$$

$$= -\frac{\partial\Gamma^{1}_{22}}{\partial x^1} - \frac{\partial\Gamma^{4}_{22}}{\partial x^4} + \frac{\partial\Gamma^{3}_{23}}{\partial x^2} - \Gamma^{1}_{22}\left(\Gamma^{1}_{11} + \Gamma^{3}_{13}\right) - \Gamma^{4}_{22}\left(\Gamma^{1}_{41} + \Gamma^{3}_{43}\right)$$

$$+\Gamma^{2}_{21}\Gamma^{1}_{22} + \Gamma^{2}_{24}\Gamma^{4}_{22} + \Gamma^{3}_{23}\Gamma^{3}_{23}$$

$$= \frac{\partial}{\partial r}\left(r + \frac{1}{2}f'r^2\right) - \frac{\partial}{\partial t}\left(\frac{1}{2}\dot{g}e^{\mu}r^2\right) + \frac{\partial}{\partial\theta}(\cot\theta)$$

$$+\left(r + \frac{1}{2}f'r^2\right)\left(\frac{1}{2}f' + \frac{1}{r} + \frac{1}{2}f'\right) - \frac{1}{2}\dot{g}e^{\mu}r^2\dot{g}$$

$$-\left(\frac{1}{r} + \frac{1}{2}f'\right)\left(r + \frac{1}{2}f'r^2\right) + \frac{1}{2}\dot{g}\cdot\frac{1}{2}\dot{g}e^{\mu}r^2$$

$$+\cot\theta\cdot\cot\theta.$$

$$= 1 + \frac{1}{2} f'' r^2 + \frac{1}{2} f' \cdot 2r - \frac{1}{2} \ddot{g} e^{\mu} r^2 - \frac{1}{2} \dot{g}^2 e^{\mu} r^2$$
$$- \operatorname{cosec}^2\theta + r f' + 1 + \frac{1}{2} f'^2 r^2 + \frac{1}{2} r f'$$
$$- \frac{1}{2} \dot{g}^2 e^{\mu} r^2 - 1 - \frac{1}{2} r f' - \frac{1}{2} r f' - \frac{1}{4} f'^2 r^2$$
$$+ \cot^2\theta .$$

$$= \frac{1}{2} f'' r^2 + \frac{3}{2} f' r - \frac{1}{2} \ddot{g} e^{\mu} r^2 - \frac{3}{4} \dot{g}^2 e^{\mu} r^2$$
$$+ \frac{1}{4} f'^2 r^2$$

$$= r^2 \left(\frac{1}{2} f'' + \frac{1}{4} f'^2 + \frac{3 f'}{2r} - \frac{1}{2} \ddot{g} e^{\mu} - \frac{3}{4} \dot{g}^2 e^{\mu} \right)$$

$$R_{33} = - \frac{\partial \Gamma_{33}^{\alpha}}{\partial x^{\alpha}} + \frac{\partial \Gamma_{3\alpha}^{\alpha}}{\partial x^{3}} - \Gamma_{33}^{\beta} \Gamma_{\beta\alpha}^{\alpha} + \Gamma_{3\alpha}^{\beta} \Gamma_{\beta 3}^{\alpha}$$

$$= - \frac{\partial \Gamma_{33}^{1}}{\partial x^{1}} - \frac{\partial \Gamma_{33}^{2}}{\partial x^{2}} - \frac{\partial \Gamma_{33}^{4}}{\partial x^{4}} + 0 - \Gamma_{33}^{1} \left(\Gamma_{11}^{1} + \Gamma_{12}^{2} + \Gamma_{13}^{3} \right)$$
$$- \Gamma_{33}^{2} \Gamma_{23}^{3} - \Gamma_{33}^{4} \left(\Gamma_{41}^{1} + \Gamma_{42}^{2} + \Gamma_{43}^{3} \right) + \Gamma_{31}^{3} \Gamma_{33}^{1}$$
$$+ \Gamma_{33}^{1} \Gamma_{13}^{3} + \Gamma_{32}^{3} \Gamma_{33}^{2} + \Gamma_{33}^{2} \Gamma_{23}^{3} + \Gamma_{33}^{4} \Gamma_{43}^{3}$$
$$+ \Gamma_{34}^{3} \Gamma_{33}^{4}$$

$$= - \frac{\partial \Gamma_{33}^{1}}{\partial x^{1}} - \frac{\partial \Gamma_{33}^{2}}{\partial x^{2}} - \frac{\partial \Gamma_{33}^{4}}{\partial x^{4}} - \Gamma_{33}^{1} \left(\Gamma_{11}^{1} + \Gamma_{12}^{2} \right)$$
$$- \Gamma_{33}^{4} \left(\Gamma_{41}^{1} + \Gamma_{42}^{2} \right) + \Gamma_{31}^{3} \Gamma_{33}^{1} + \Gamma_{32}^{3} \Gamma_{33}^{2}$$
$$+ \Gamma_{34}^{3} \Gamma_{33}^{4}$$

$$= \frac{\partial}{\partial r} \left\{ \left(r + \frac{1}{2} f' r^2 \right) \sin^2\theta \right\} + \frac{\partial}{\partial \theta} \left(\sin\theta \cos\theta \right)$$
$$- \frac{1}{2} \frac{\partial}{\partial t} \left(\dot{g} e^{\mu} r^2 \sin^2\theta \right) + \left\{ \left(r + \frac{1}{2} f' r^2 \right) \sin^2\theta \right\} \cdot \left(\frac{1}{r} + f' \right)$$
$$- \frac{1}{2} \dot{g} e^{\mu} r^2 \sin^2\theta \cdot g - \left(\frac{1}{r} + \frac{1}{2} f' \right) \left\{ \left(r + \frac{1}{2} f' r^2 \right) \sin^2\theta \right\}$$
$$- \cot\theta \cdot \sin\theta \cos\theta + \frac{1}{4} g \cdot \dot{g} e^{\mu} r^2 \sin^2\theta$$

$$= 1 + \frac{1}{2} f'' r^2 + \frac{1}{2} f' . 2r - 1 - \frac{1}{2} \ddot{g} e^{\mu} r^2$$
$$- \frac{1}{2} \dot{g}^2 e^{\mu} r^2 + r f' + 1 + \frac{1}{2} f'^2 r^2 + \frac{1}{2} r f'$$
$$- \frac{1}{2} \dot{g}^2 e^{\mu} r^2 - 1 - \frac{1}{2} r f' - \frac{1}{2} r f' - \frac{1}{4} f'^2 r^2$$
$$+ \frac{1}{4} \dot{g}^2 e^{\mu} r^2 \sin^2\theta .$$

$$= r^2 \left(\frac{1}{2} f'' + \frac{3}{2} \frac{f'}{r} - \frac{1}{2} \ddot{g} e^{\mu} - \frac{3}{4} \dot{g}^2 e^{\mu} + \frac{1}{4} f'^2 \right) \sin^2\theta .$$

$$= r^2 \left(\frac{1}{2} f'' + \frac{1}{4} f'^2 + \frac{3}{2} \frac{f'}{r} - \frac{1}{2} \ddot{g} e^{\mu} - \frac{3}{4} \dot{g}^2 e^{\mu} \right) \sin^2\theta$$

$$= R_{22} \sin^2\theta$$

$$R_{44} = - \frac{\partial \Gamma^{\alpha}_{44}}{\partial x^{\alpha}} + \frac{\partial \Gamma^{\alpha}_{4\alpha}}{\partial x^4} - \Gamma^{\beta}_{44} \Gamma^{\alpha}_{\beta\alpha} + \Gamma^{\beta}_{4\alpha} \Gamma^{\alpha}_{\beta 4}$$

$$= 0 + \frac{\partial}{\partial x^4} \Gamma^1_{41} + \Gamma^2_{42} + \Gamma^3_{43} - 0 + \Gamma^1_{41} \Gamma^1_{14}$$
$$+ \Gamma^2_{42} \Gamma^2_{24} + \Gamma^3_{43} \Gamma^3_{34}$$

$$= \frac{\partial}{\partial t} \left(\frac{3}{2} \dot{g} \right) + \frac{1}{2} \dot{g} \, \frac{1}{2} \dot{g} + \frac{1}{2} \dot{g} . \frac{1}{2} \dot{g}$$
$$+ \frac{1}{2} \dot{g} . \frac{1}{2} \dot{g}$$

$$= \frac{3}{2} \ddot{g} + \frac{3}{4} \dot{g}^2$$

and $R_{ij} = 0$ for $i \neq j$

Now $R^1_1 = g^{11} R_{11} = - e^{-\mu} \left[f'' + \frac{f'}{r} - e^{\mu} \left(\frac{1}{2} \ddot{g} + \frac{3}{4} \dot{g}^2 \right) \right]$

$$R^2_2 = g^{22} R_{22} = - \frac{e^{-\mu}}{r^2} . r^2 \left[\frac{1}{2} f'' + \frac{1}{4} f'^2 + \frac{3}{2} \frac{f'}{r} - \frac{1}{2} \ddot{g} e^{\mu} - \frac{3}{4} \dot{g}^2 e^{\mu} \right]$$