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$$\sigma_r(r) = \frac{p_i r_i^2 \left(1 - \frac{r_d^2}{r^2}\right)}{(r_d^2 - r_i^2)} - \frac{p_d r_d^2 \left(1 - \frac{r_i^2}{r^2}\right)}{(r_d^2 - r_i^2)} + \left(\frac{3 + \nu}{8}\right) \rho \omega^2 \left[r_i^2 + r_d^2 - \left(\frac{r_i^2 r_d^2}{r^2}\right) - r^2 \right]$$

$$\sigma_t(r) = \frac{p_i r_i^2 \left(1 + \frac{r_d^2}{r^2}\right)}{(r_d^2 - r_i^2)} - \frac{p_d r_d^2 \left(1 + \frac{r_i^2}{r^2}\right)}{(r_d^2 - r_i^2)} + \left(\frac{3 + \nu}{8}\right) \rho \omega^2 \left[r_i^2 + r_d^2 + \left(\frac{r_i^2 r_d^2}{r^2}\right) - r^2 \left(\frac{1 + 3\nu}{3 + \nu}\right) \right]$$

$$\omega = 0 \quad u(r) = \left[\left(\frac{p_i}{E}\right) \left(\frac{r_i^2}{r_d^2 - r_i^2}\right) \left((1 - \nu) + (1 + \nu) \left(\frac{r_d^2}{r^2}\right) \right) r \right] - \left[\left(\frac{p_d}{E}\right) \left(\frac{r_d^2}{r_d^2 - r_i^2}\right) \left((1 - \nu) + (1 + \nu) \left(\frac{r_i^2}{r^2}\right) \right) r \right]$$

$$\omega = 0 \quad p_i = 0 \quad p_d = 0$$

$$p_0 = \frac{\delta}{\left[\left(\frac{R_2}{E_1}\right) \left(\frac{R_2^2 + R_1^2}{R_2^2 - R_1^2} - \nu_1\right) \right] + \left[\left(\frac{R_2}{E_2}\right) \left(\frac{R_3^2 + R_2^2}{R_3^2 - R_2^2} + \nu_2\right) \right]}$$

$$u(r) = r \varepsilon_t = \frac{r}{E} (\sigma_t - \nu \sigma_r)$$

$$\sigma_v = \sqrt{(\sigma_r)^2 + (\sigma_t)^2 - \sigma_r \sigma_t}$$