36. $yy''_{xx} - n(y'_x)^2 + f(x)y^2 + ay^{4n-2} = 0.$

1°. For $n = 1$, this is an equation of the form 3.37.

2°. For $n \neq 1$, the substitution $w = y^{1-n}$ leads to Ermakov (Yermakov) equation 3.5:

$$w''_{xx} + (1-n)f(x)w + a(1-n)w^{-3} = 0.$$

Reference

Polyanin, A. D. and Zaitsev, V. F., *Handbook of Exact Solutions for Ordinary Differential Equations, 2nd Edition*, Chapman & Hall/CRC, Boca Raton, 2003.

