p_{max}

$$t_e = \frac{p + r(p^2 + q^2)/v}{\omega}$$

$$\dot{\omega} = 0$$

$$0 = -D\omega - t_e + u_{max}$$

$$(1)$$

$$(2)$$

$$\dot{\omega} = 0 \tag{2}$$

$$0 = -D\omega - t_e + u_{max} \tag{3}$$

$$\frac{p+rp^2}{v} = -D\omega^2 + u_{max}\omega - rq^2/v$$
Assume: $p \le 1$ (5)

Assume:
$$p \le 1$$
 (5)

$$p_{max} = \frac{v}{1+r} \left(-D\omega^2 + u_{max}\omega - rq^2/v \right) \tag{6}$$