

Optimal Servo Gear Reduction Ratio

For an optimal dynamic performance of a servo system the ratio of the reflected load- inertia to the motor rotor-inertia shall be approximately equal unity.

$$J_{\text{Load Reflected}} / J_{\text{Motor Rotor}} = 1 \quad (J_{\text{Load Reflected}} = J_{\text{Load}} / i^2)$$

i- Gear Reduction Ratio

With the above the optimal Gear reduction Ratio :

$$i \approx \sqrt{ (J_{\text{Load}} / J_{\text{Motor Rotor}}) }$$

Next to the optimal dynamic performance of a servo system achieved by using the above gear reduction ratio, the servomotor and servo drive size selection has the best-balanced economy.