The transmitted power, however, is constant disregarding friction losses in the bearings.

$$\frac{M_{dI}}{M_{dII}} = \frac{\omega_{II}}{\omega_{I}} \qquad \frac{\omega_{I}}{\omega_{II}} = \frac{M_{dII}}{M_{dI}}$$

Therefore, the following applies:

$$N_I = N_{II} = \text{Constant}$$

$$M_{dI} \cdot \omega I_1 = M_{dII} \cdot \omega_{II} = \text{Constant}$$

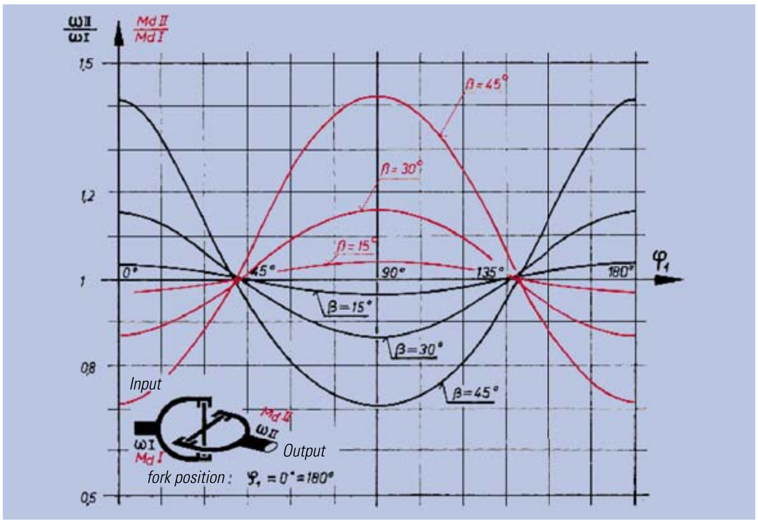
$$\frac{M_{dI}}{M_{dII}} = \frac{\omega_{II}}{\omega_{I}} = \frac{\cos ß}{1 - \cos^2 \varphi_1 \cdot \sin^2 ß}$$

For fork position $\varphi_1 = 0°$ we obtain:

$$\frac{M_{dI}}{M_{dII\,min}} = \frac{1}{\cos ß} = \frac{\omega_{II\,max}}{\omega_{I}}$$

and for fork position $\varphi_1 = 90°$:

$$\frac{M_{dI}}{M_{dII\,max}} = \cos ß = \frac{\omega_{II\,min}}{\omega_{I}}$$



2.3 Motion and torque characteristic of a universal driveline

as a function of deflection angles $ß_1$ and $ß_2$

Section 2.2 illustrates that angular velocity and torque at the output of a single joint follow a sinusoidal pattern with a 180° cycle. Maximum angular velocity $\omega_{II\,max}$ max coincides with minimum torque $M_{d\,II\,min}$ and vice versa. From this can be derived that a uniform output is then possible,when a sec-ond joint, having a 90° phase shift is connected to the first joint by means of a shaft. Then, the non-uniform motion of the first joint can be balanced by the non-uniform motion of the second joint. The required 90° phase shift is always then met, when the two inner forks happen to be in the deflection plane of their respective joints. Moreover, the two deflection angles $ß_1$ und $ß_2$ of both joints must be the same. (See also Section 1.1 and 1 .4).

With unequal deflection angles, complete compensation is not possible.
For $ß_2 > ß_1$ the following applies:

$$\left(\frac{\omega_{II\,min}}{\omega_I}\right) max = \frac{\cos ß_1}{\cos ß_2}$$

$$\left(\frac{\omega_{II\,min}}{\omega_I}\right) min = \frac{\cos ß_2}{\cos ß_1}$$

$$\left(\frac{M_{dII}}{M_{dI}}\right) max = \frac{\cos ß_1}{\cos ß_2}$$

$$\left(\frac{M_{dII}}{M_{dI}}\right) min = \frac{\cos ß_2}{\cos ß_1}$$