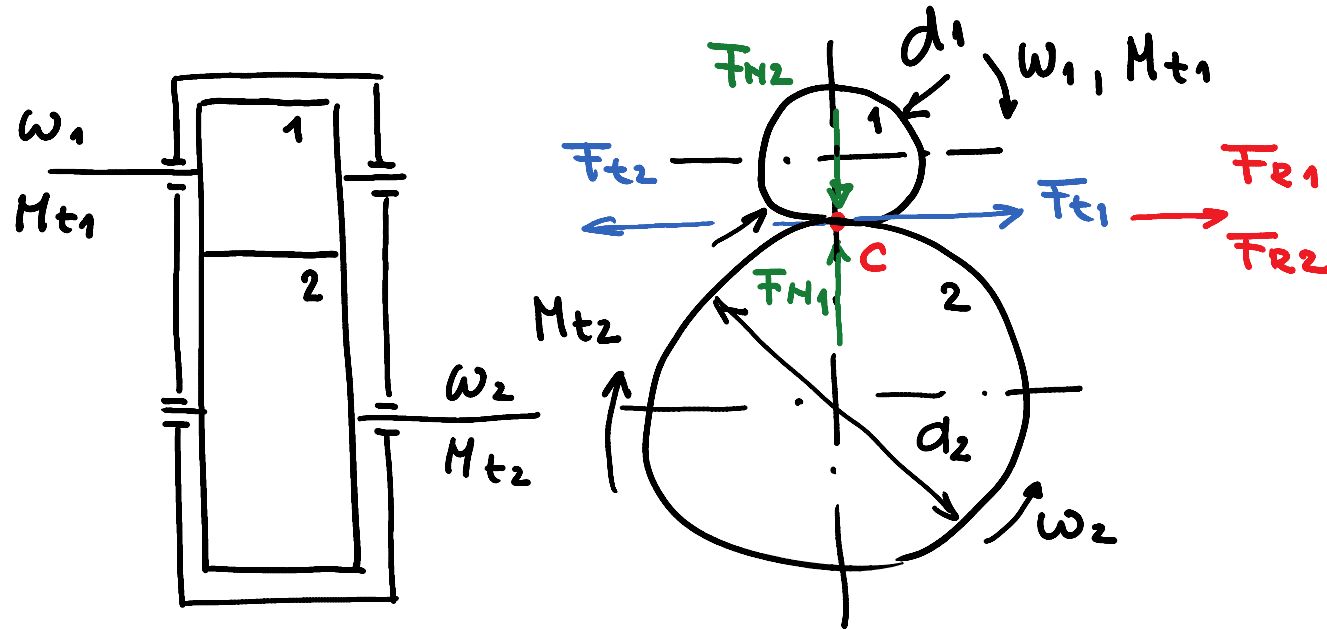


TORNA KONILA



C KINEMATIČNA TOČKA

$$F_{N1} = F_{N2} = F_N$$

$$F_{R1} = F_{R2} = F_R$$

$$F_{t1} \leq F_{R1} = F_{N1} \cdot \mu$$

$$F_{t2} \leq F_{R2} = F_{N2} \cdot \mu$$

POENOSTAVljena OBRAUNAVA PRESTAVNEGA RAZMERJA

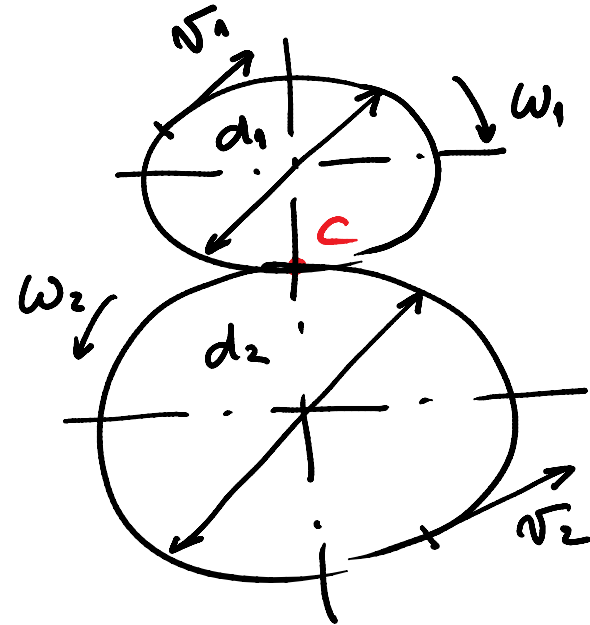
$$i = \frac{\omega_1}{\omega_2}$$

$$v_1 = \omega_1 \cdot \frac{d_1}{2} ; v_2 = \omega_2 \cdot \frac{d_2}{2}$$

$$i = \frac{z v_1 d_2}{d_1 z v_2} = \frac{v_1}{v_2} \cdot \frac{d_2}{d_1}$$

$v_1 > v_2$ POSLEDICA
ZDRSA

$$i \geq \frac{d_2}{d_1} ; i = \frac{\omega_1}{\omega_2}$$



IZ KORISTEK TORNEGA GONILA

$$\eta = \frac{P_2}{P_1} = \frac{M_{t2} \cdot \omega_2}{M_{t1} \cdot \omega_1} = \frac{M_{t2} \cdot 2 \nu_2 \cdot d_1}{d_2 \cdot M_{t1} \cdot 2 \nu_1} = \frac{\cancel{F_{t2}} \cdot \cancel{\nu_2}}{\cancel{F_{t1}} \cdot \cancel{\nu_1}}$$

MANJ KOT 1

MANJ KOT 1

NA IZKORISTEK TORNEGA GONILA VPLIVATA ŽDRS (ν_2/ν_1)
IN DEFORMIRANJE TORNIH KOLEŠ V TOČLI C (F_{t2}/F_{t1})

MAKSIMALNA MOĆ, ŠI JO PREKO TORNEGA GONILA
LAHKO PREVAŠAMO

$$P_{max} = F_{tmax} \cdot v_1 = F_R \cdot v_1 = F_H \cdot \mu \cdot \omega_1 \cdot \frac{d_1}{2}$$

TRDI TORNI MATERIALI: $F_H \uparrow$, $\mu \downarrow$ ✓✓ MAJHNA OBRABA

MEHKI TORNI MATERIALI: $F_H \downarrow$, $\mu \uparrow$ ✓✓ VEČJA OBRABA

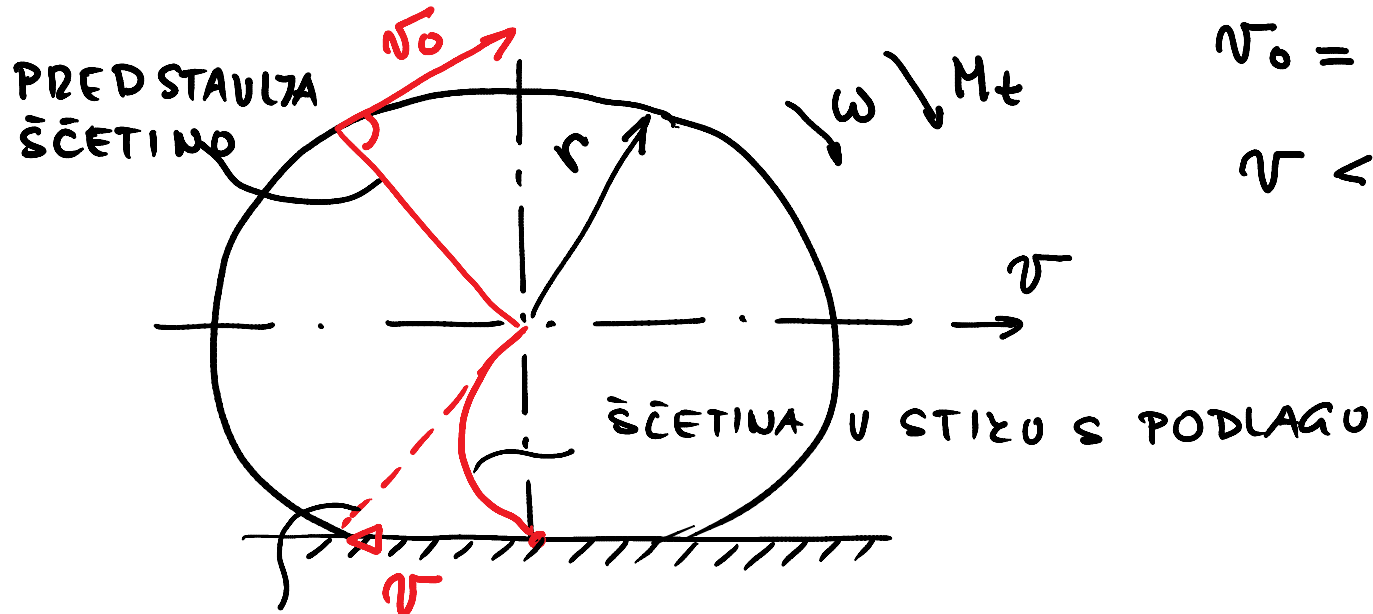
$\omega_1 \uparrow$ ✓

$d_1 \uparrow$ ✗

- + TIH TEŽ V PRIMERJAVI + GONILI, KI IZ KORISČAJO OBLI EDUNO ŽUETO
- + DUŠIJO VIBRACIJE
- + VARUJEJO PRED PREOBREHENUITVIJO
- + ENOSTAVNA IZDELAVA
- ŽDRS
- NENATAVČNO VRTENJE GNANE GREDI
- OBRABA TORNIH POUŠIN
- OBREHENUITEV GREDI $F_w \uparrow$

RAŽMERE PRI NAČETALJEVANJU

POSPEŠEVANJE



$$v_0 = \omega \cdot r$$

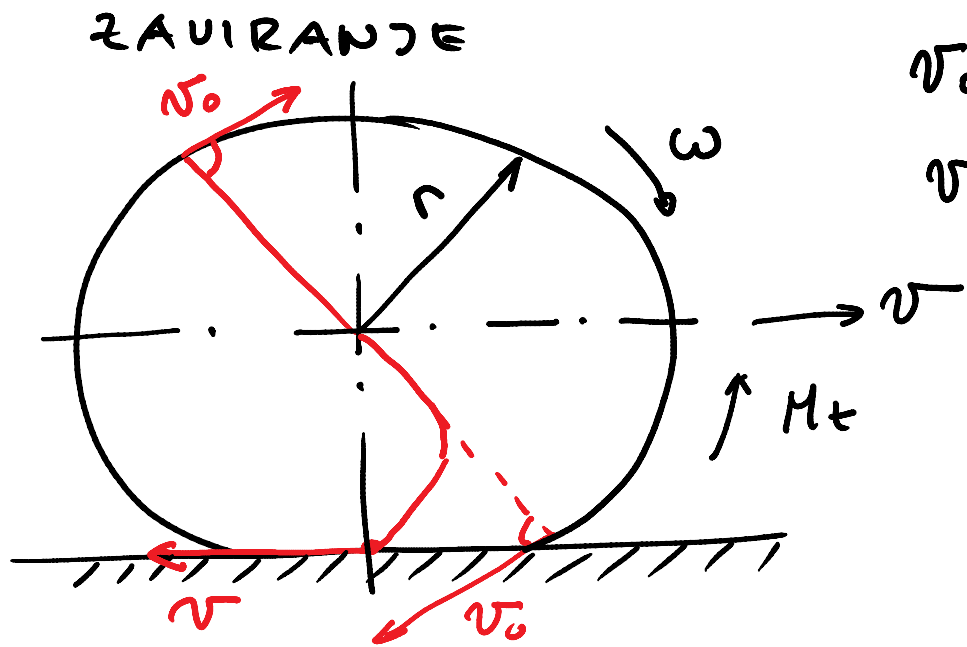
$$v < v_0$$

ŠČETINA, KI NI U STIKU S PODLAGO

$$G^v = \frac{v_0 - v}{v_0} \rightarrow v = -v_0 G^v + v_0 = v_0 (1 - G^v)$$

\uparrow zDRS
 \uparrow NI zDRSA
 \downarrow ČISTI zDRS

$$v = v_0 (1 - G^v)$$



$$v_0 = \omega \cdot r$$

$$v > v_0$$

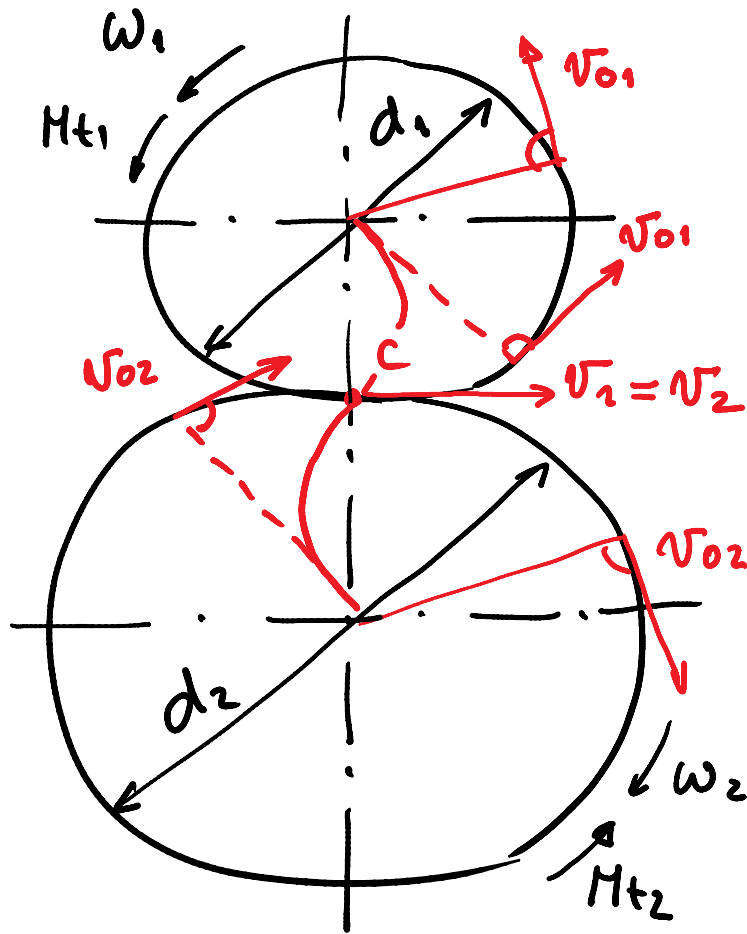
$$\zeta = \frac{v - v_0}{v}$$

$$v_0 = v(1 - \zeta)$$

$$v \zeta = v - v_0$$

$0 \leq \zeta \leq 1$ — ЧИСТИ ЗДРС
 ↑
 ЧИСТО НАКОТАЛЈЕУАНИЕ

PRESTAVNO RAŽMERJE TORNEGA GONILA



$$v_{01} = \omega_1 \cdot \frac{d_1}{2} ; v_{02} = \omega_2 \cdot \frac{d_2}{2}$$

$$v_{01} > v_1 ; v_2 > v_{02}$$

$$v_1 = v_2 = v$$

$$\sigma_1 = \frac{v_{01} - v}{v_{01}} ; \sigma_2 = \frac{v - v_{02}}{v}$$

$$v = v_{01}(1 - \sigma_1) ; v_{02} = v(1 - \sigma_2)$$

$$i = \frac{\omega_1}{\omega_2} = \frac{v_{01} \cdot 2d_2}{d_1 \cdot 2v_{02}}$$

$$= \frac{v}{(1 - \sigma_1)v(1 - \sigma_2)d_1} d_2$$

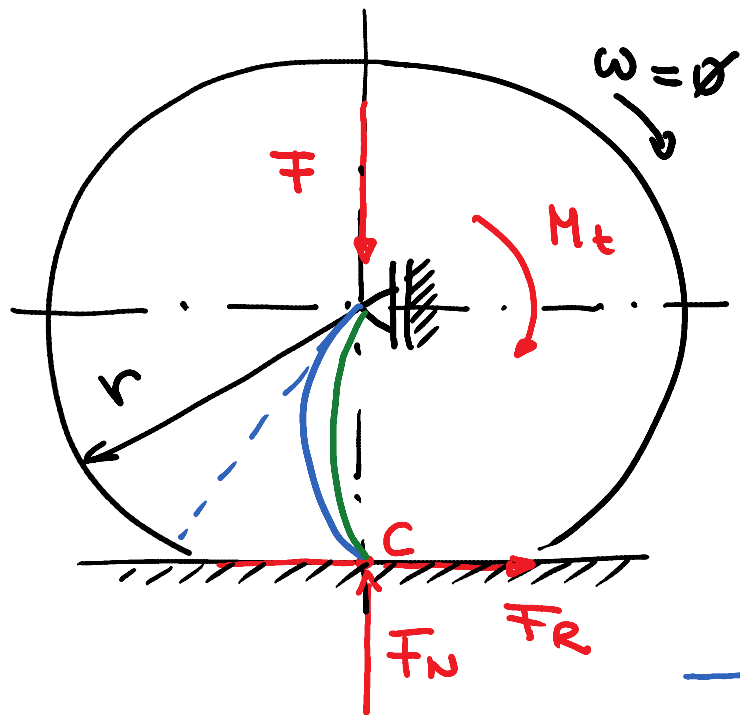
$$i = \frac{1}{(1 - \sigma_1)(1 - \sigma_2)} \frac{d_2}{d_1}$$

KOEFICIENT SOJEMANJA

$$\mu = \frac{F_R}{F_N} \quad \text{KOEFICIENT TRENJA}$$

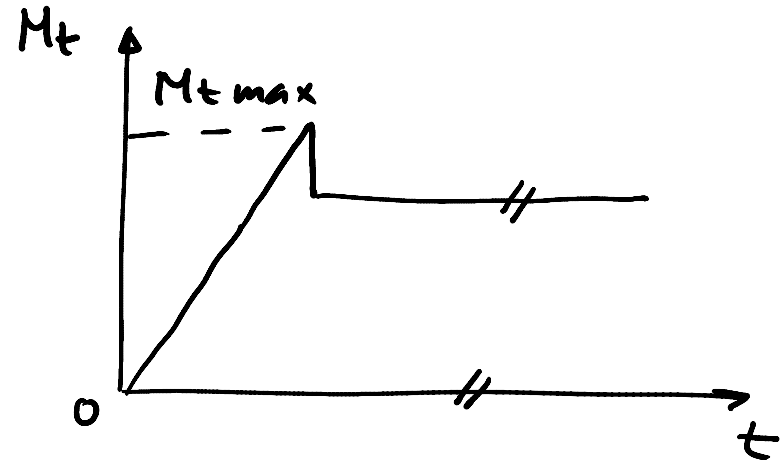
$$\mu_H = \frac{F_t}{F_N} \quad \text{KOEFICIENT SOJEMANJA}$$

$$\mu_H \leq \mu \quad \text{KER JE } F_t \leq F_R$$



$$F = F_N$$

$$M_t = F_t \cdot r$$

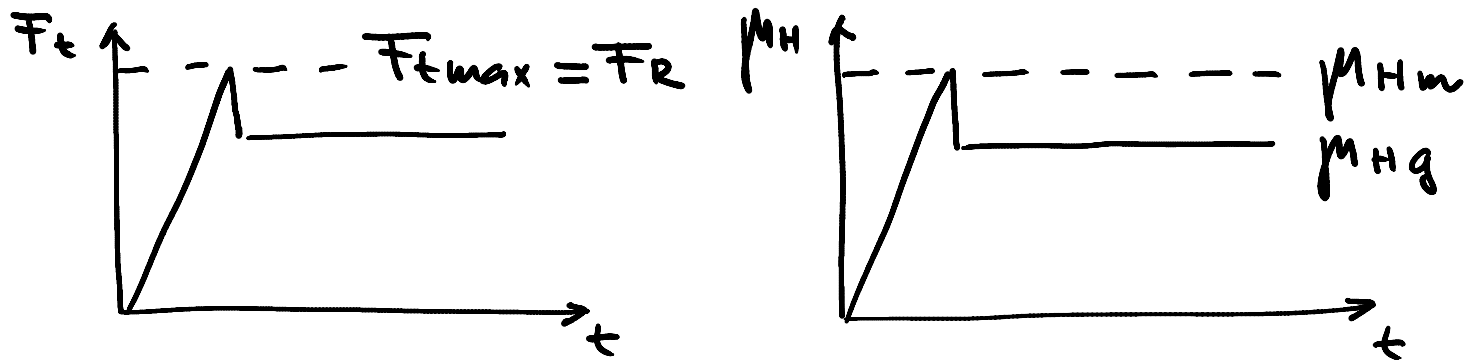


$$M_{tmax} = F_R \cdot r$$

$$F_R = F_N \cdot \mu$$

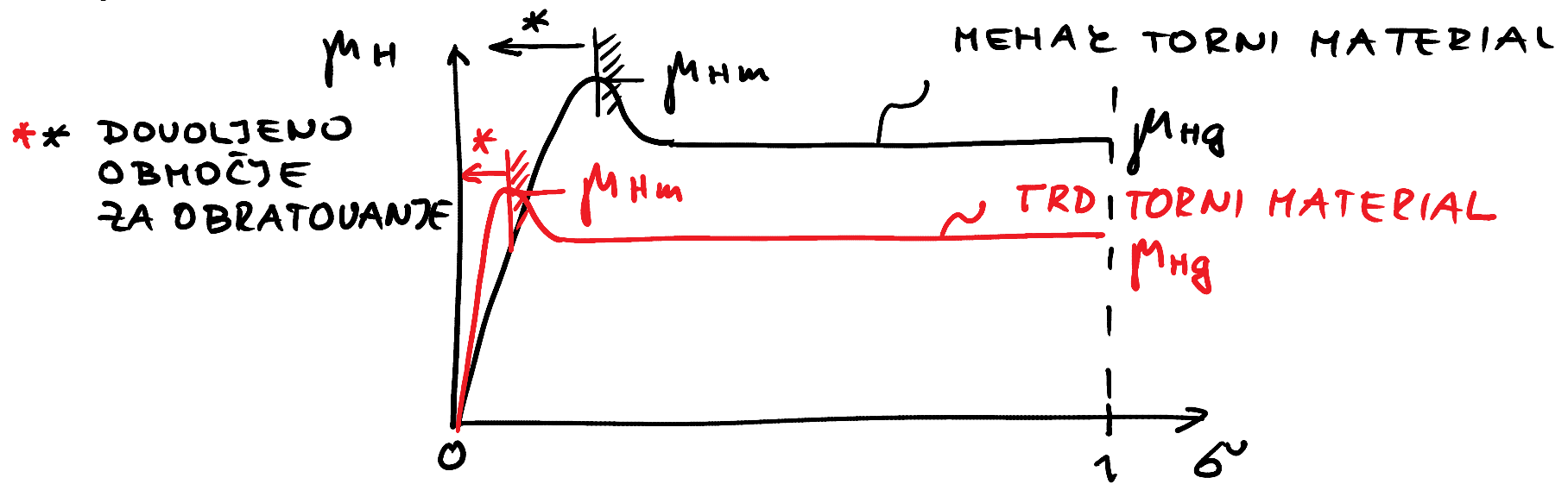
— POLOŃAJ ŚCĘTINE
TIZ PRED ŃDRSOM

— POLOŃAJ ŚCĘTINE
PO ŃDRSU

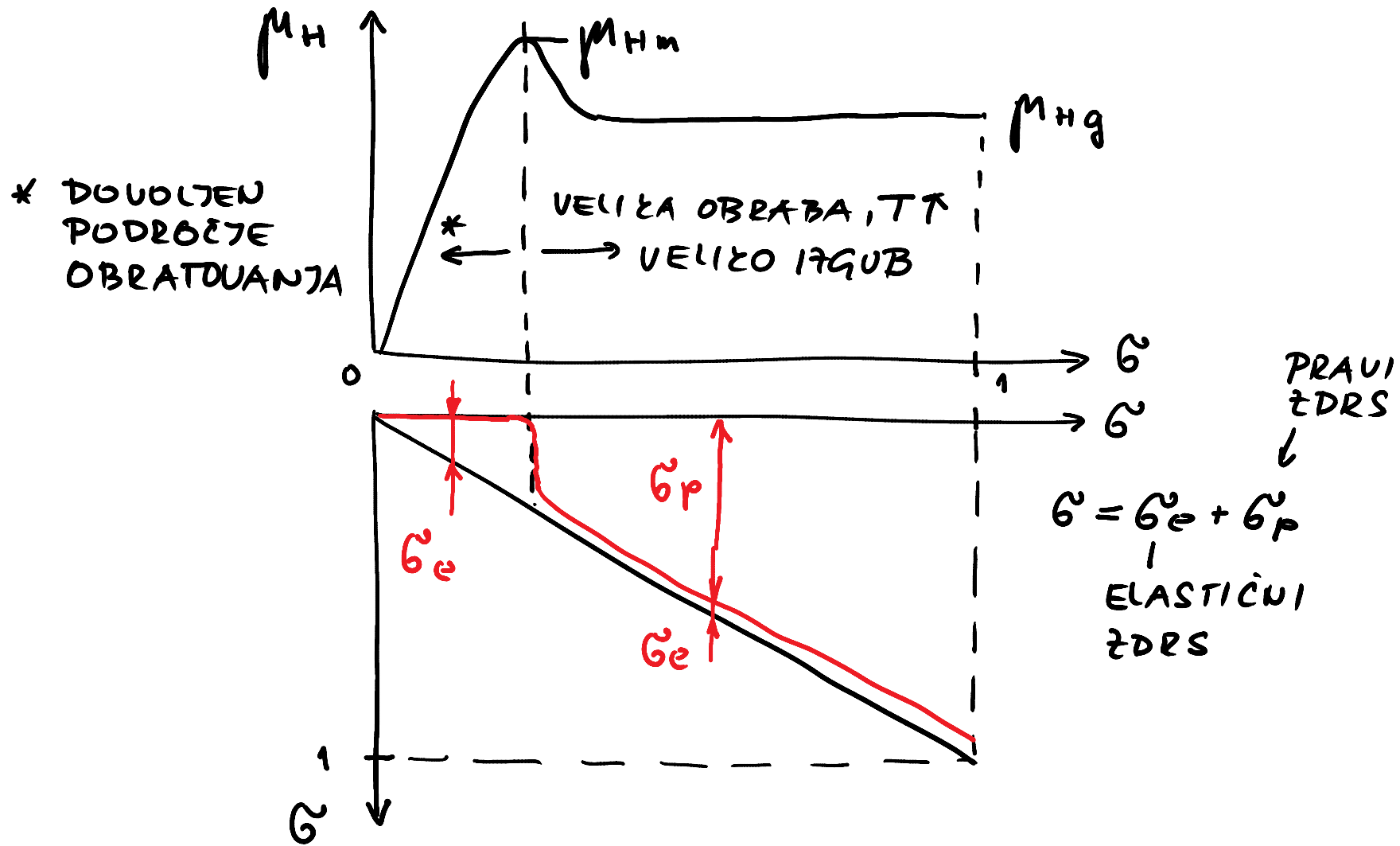


μ_{Hm} KOEFICIENT SOJEHANJA PRI MIROVANJU

μ_{Hg} KOEFICIENT SOJEHANJA PRI GIBANJU



RAZČLENITEV ŽDRSA NA ELASTIČNI IN PRAVI ŽDRS



UREDNOTENJE TORNIH GONIL

UREDNOTENJE KONTAKTNE OBREHENTIVE F_N

KRITERIJ ZA UREDNOTENJE MEHANSkih TORNIH MATERIALOU

$$F_N \leq F_{Ndop} = f(d_1, L, \sigma_1)$$

PREMER GONILNEGA
TORNEGA KOLESJA

↑
ŠIRINA

TORNEGA KOLESJA

UREDNOTENJE POUŠINSKEGA TLAKA P_H

KRITERIJ ZA UREDNOTENJE TRDIH TORNIH MATERIALOU

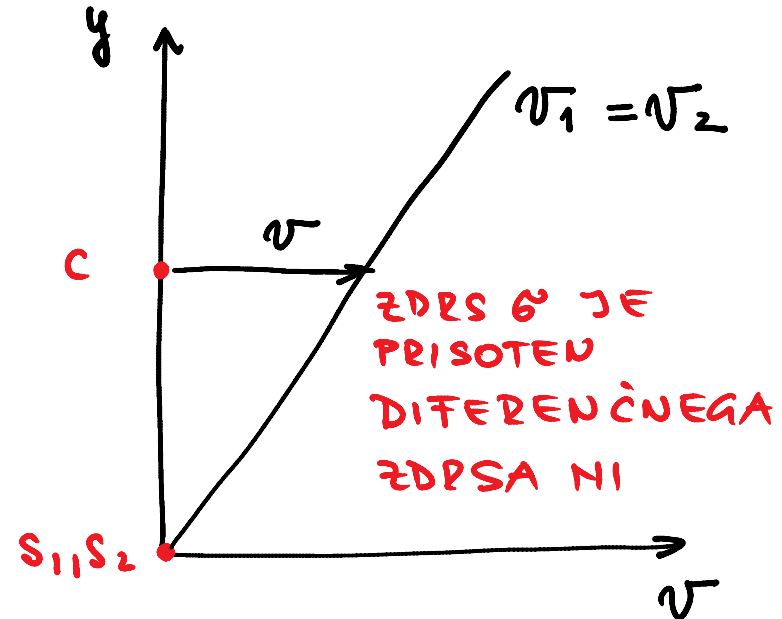
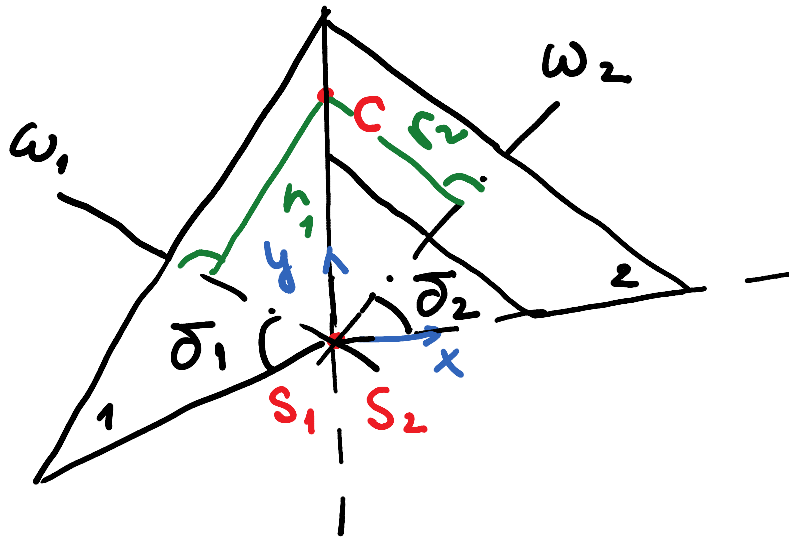
$$P_H \leq P_{Hdop} = f(\text{KOMBINACIJA TORNIH MATERIALOU,} \\ \text{MATERIJE, DIFERENČNI TORI})$$

UREDNOTENJE OBRABE

$$\Delta r \leq \Delta r_{dop} \quad \Delta r = \frac{d_1(t=\phi) - d_1(t>\phi)}{2}$$

UREDNOTENJE SEGREVANJA $T \leq T_{dop}$

DIFERENČNI ŽDRS

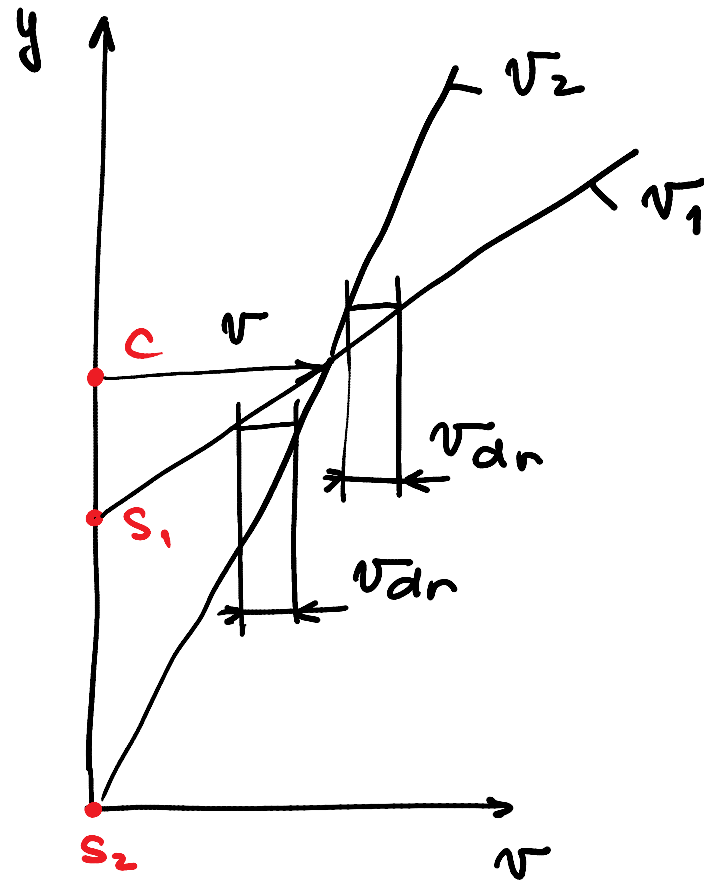
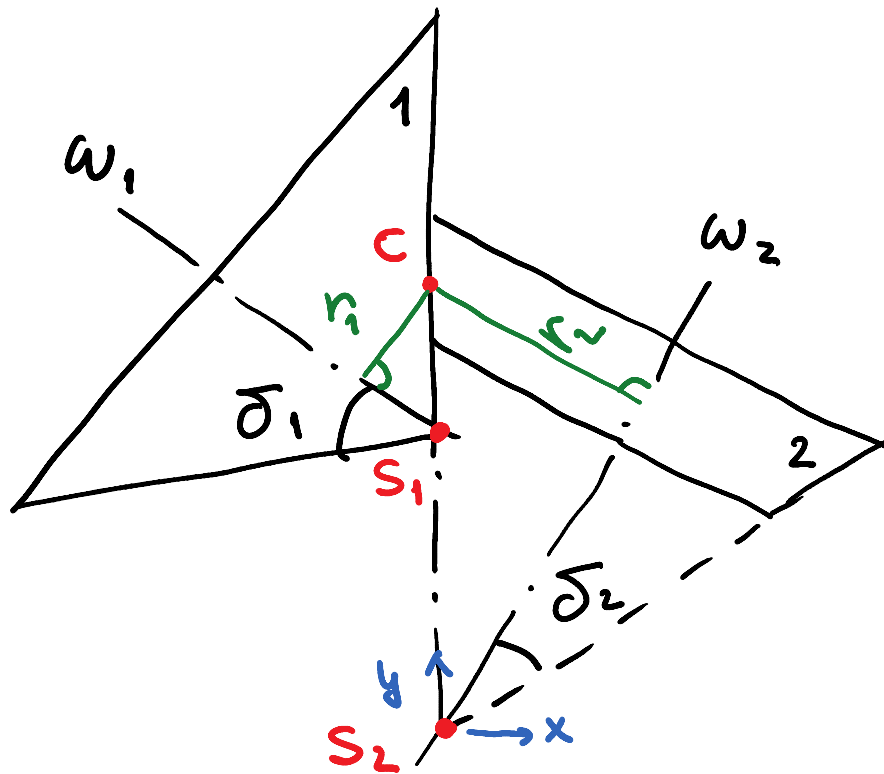


$$v = \frac{\omega_1}{\omega_2} ; v = \omega_1 \cdot r_1 = \omega_2 \cdot r_2$$

$$v = \frac{\omega_1}{\omega_2} = \frac{v_1}{v_2} \cdot \frac{r_2}{r_1} = \frac{r_2}{r_1} = \frac{\frac{S_1 C}{S_1 C} \sin \delta_2}{\frac{S_1 C}{S_1 C} \sin \delta_1} = \frac{\sin \delta_2}{\sin \delta_1}$$

G JE ZANEMARJEN V ENAČBI

$$\sin \delta_1 = \frac{r_1}{S_1 C} ; \sin \delta_2 = \frac{r_2}{S_1 C}$$



$$v = \omega_1 \cdot r_1 = \omega_2 \cdot r_2$$

RAZLIKA HITROSTI v_{dr} POUČOČA DIFERENCIJALNIM DRGAM!

$$v_{dr} = v_1 - v_2$$