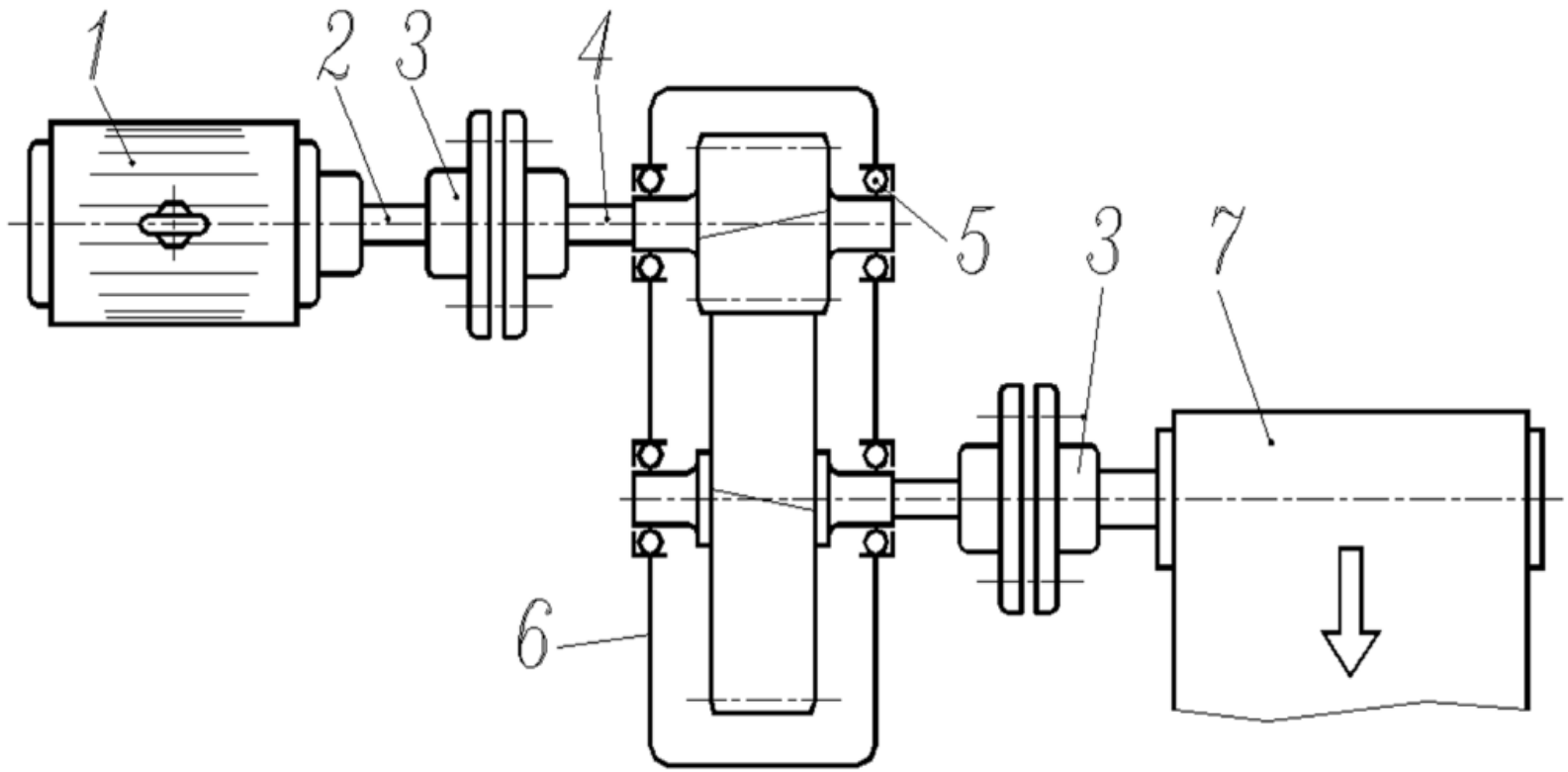
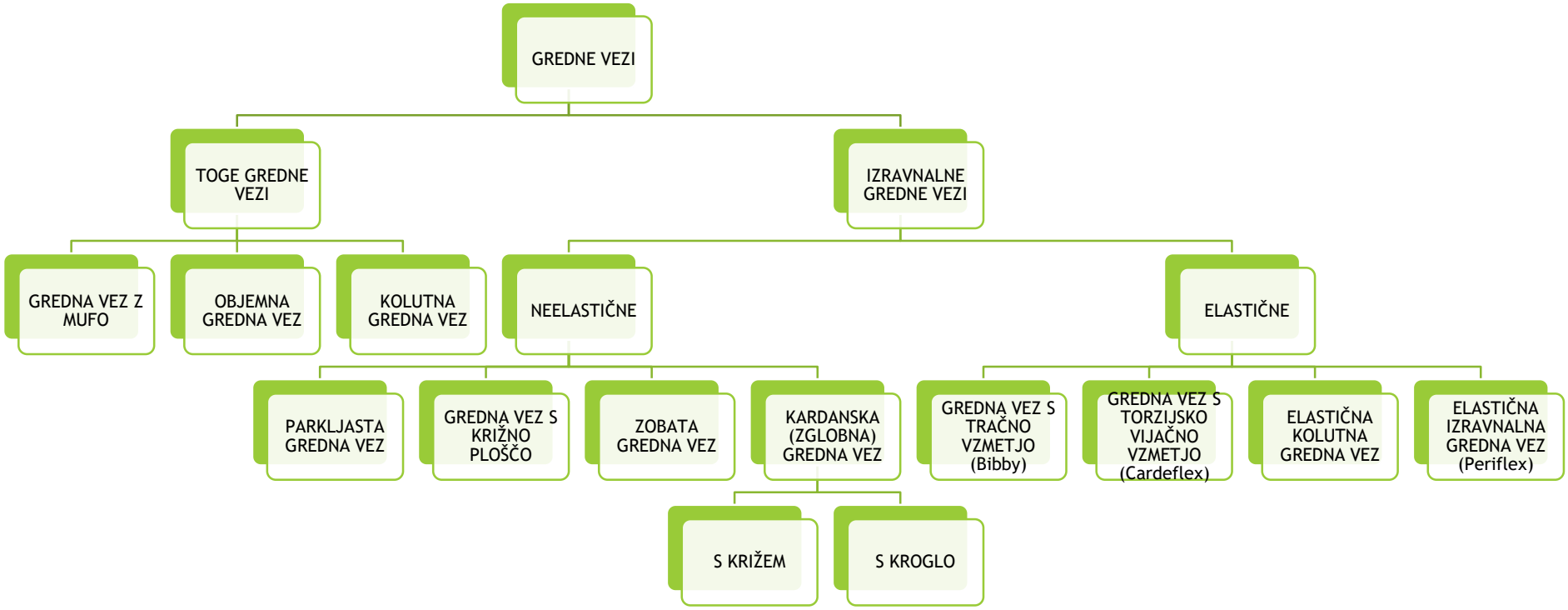
GREDNE VEZI IN SKLOPKE

https://www.youtube.com/watch?v=49l6ltnntFw

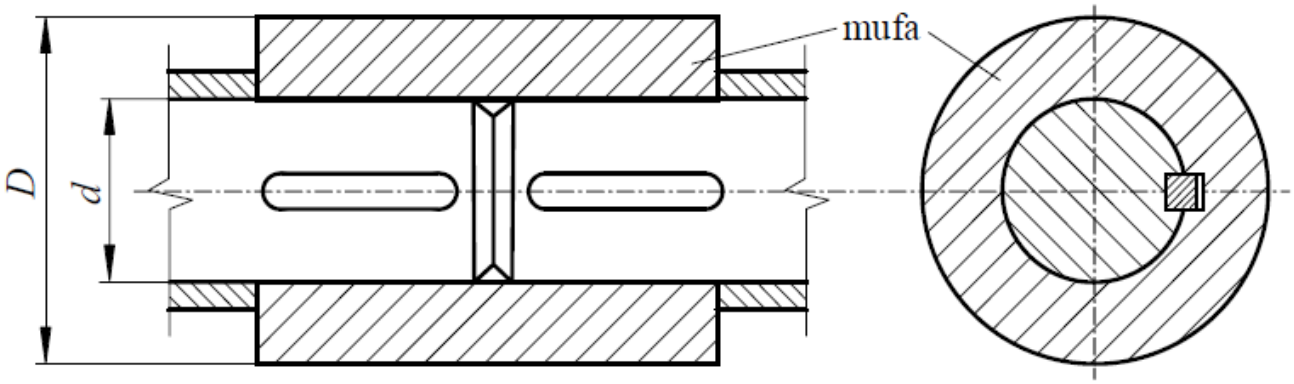


1 - pogonski stroj, 2 - gonilna gred, 3 - gredna vez, 4 - gnana gred, 5 - ležaji gnane gredi, 6 - reduktor, 7 - delovni stroj


GREDNE VEZI
TOGE GREDNE VEZI
IZRAVNALNE GREDNE VEZI
GREDNA VEZ Z MUFO
OBJEMNA GREDNA VEZ
KOLUTNA GREDNA VEZ
NEELASTIČNE
ELASTIČNE
PARKLJASTA GREDNA VEZ
GREDNA VEZ S KRIŽNO PLOŠČO
ZOBATA GREDNA VEZ
KARDANSKA (ZGLOBNA) GREDNA VEZ
GREDNA VEZ S TRAČNO VZMETJO (Bibby)
GREDNA VEZ S TORZIJSKO VIJAČNO VZMETJO (Cardeflex)
ELASTIČNA KOLUTNA GREDNA VEZ
ELASTIČNA IZRAVNALNA GREDNA VEZ (Periflex)
S KRIŽEM
S KROGLO

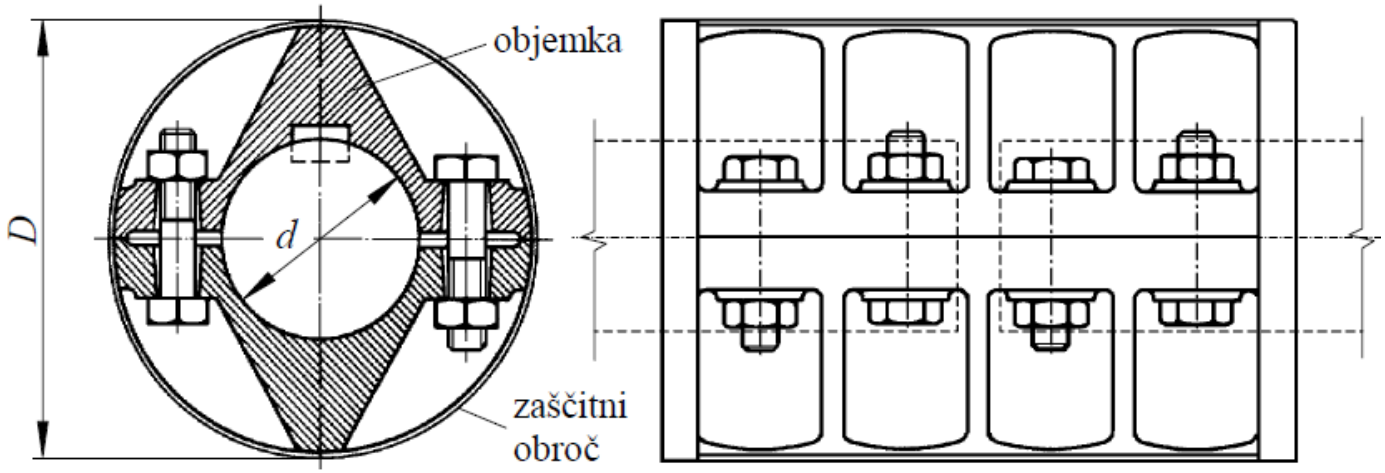
TOGE GREDNE VEZI

gredna vez z mufo

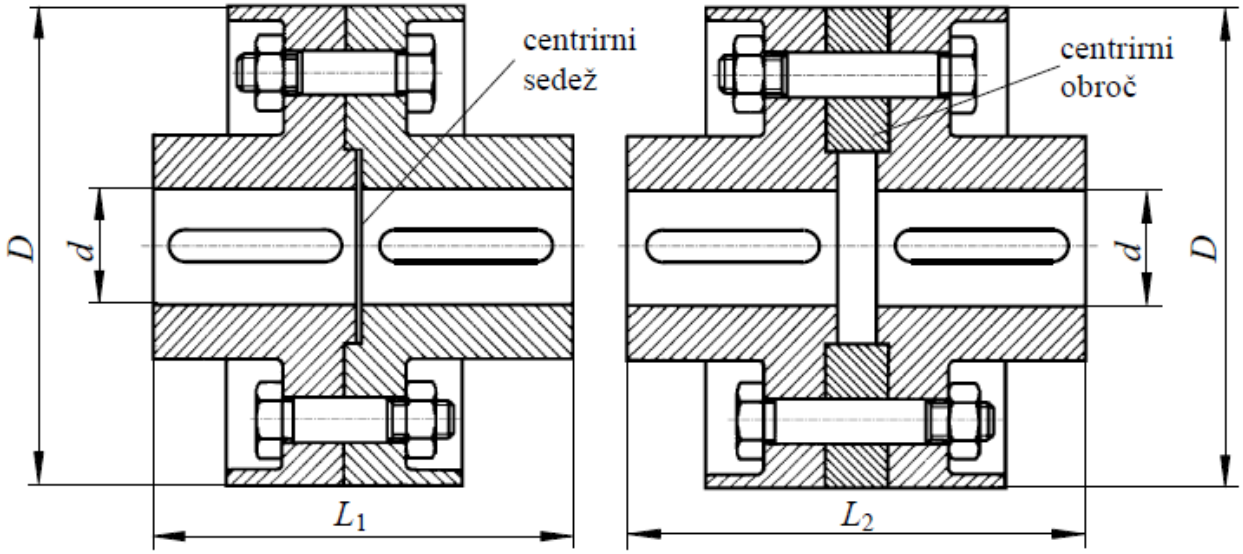


D/d = 1,5 - 2

objemna gredna vez (DIN 115)



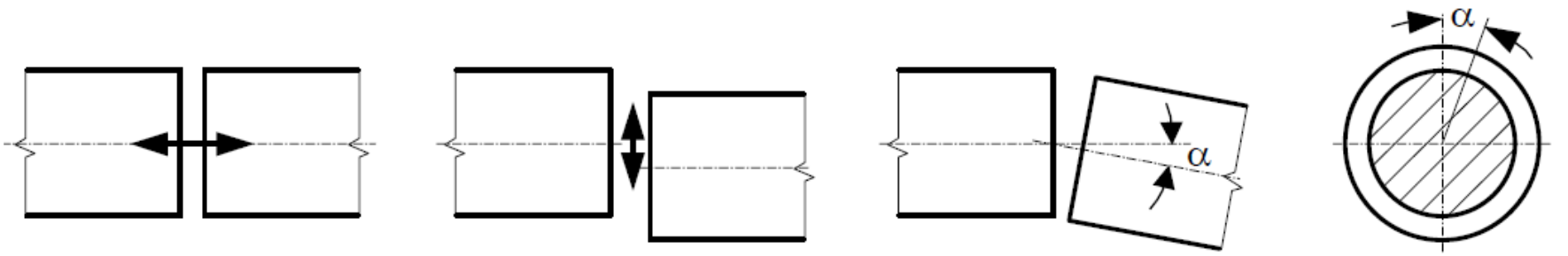
kolutna gredna vez (DIN 116)



d [mm]	D [mm]	L_1 [mm]	L_2 [mm]	T_{dop} [Nm]	d [mm]	D [mm]	L_1 [mm]	L_2 [mm]	T_{dop} [Nm]
25	125	101	110	46,2	**70**	200	201	210	1700
30				87	**80**	224	221	230	2650
35	140	121	130	150	**90**	250	241	250	4120
40				236	**100**	280	261	270	5800
45	160	141	150	355	**110**	300	281	290	8250
50				515	**120**	335	311	320	12500
55	180	171	180	730	**140**	375	341	350	19000
60				1975	**160**	425	401	410	30700

IZRAVNALNE GREDNE VEZI

IZRAVNAVAJO LAHKO nenatančnosti položaja gredi,
ki nastanejo pri montaži, temperaturnih spremembah, elastičnih deformacijah gredi,…



vzdolžni premik | prečni premik | kotni premik | krožni zasuk

Elementi, ki prenašajo obremenitev oz. vrtilni moment so oblikovani tako, da te napake izravnajo. Elementi so lahko TOGI ali ELASTIČNI.

Elastični elementi še zmanjšujejo in blažijo sunkovite obremenitve.

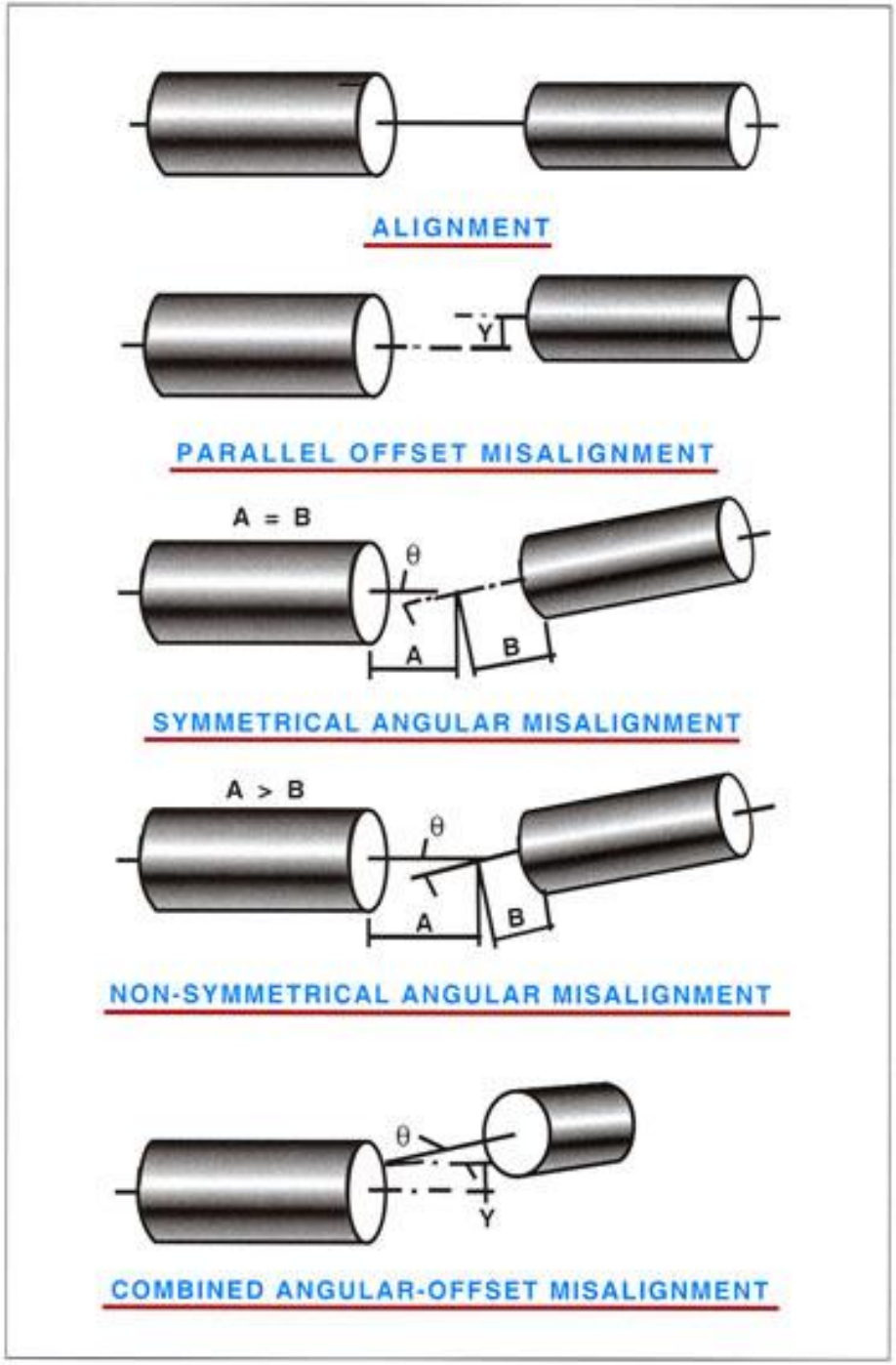
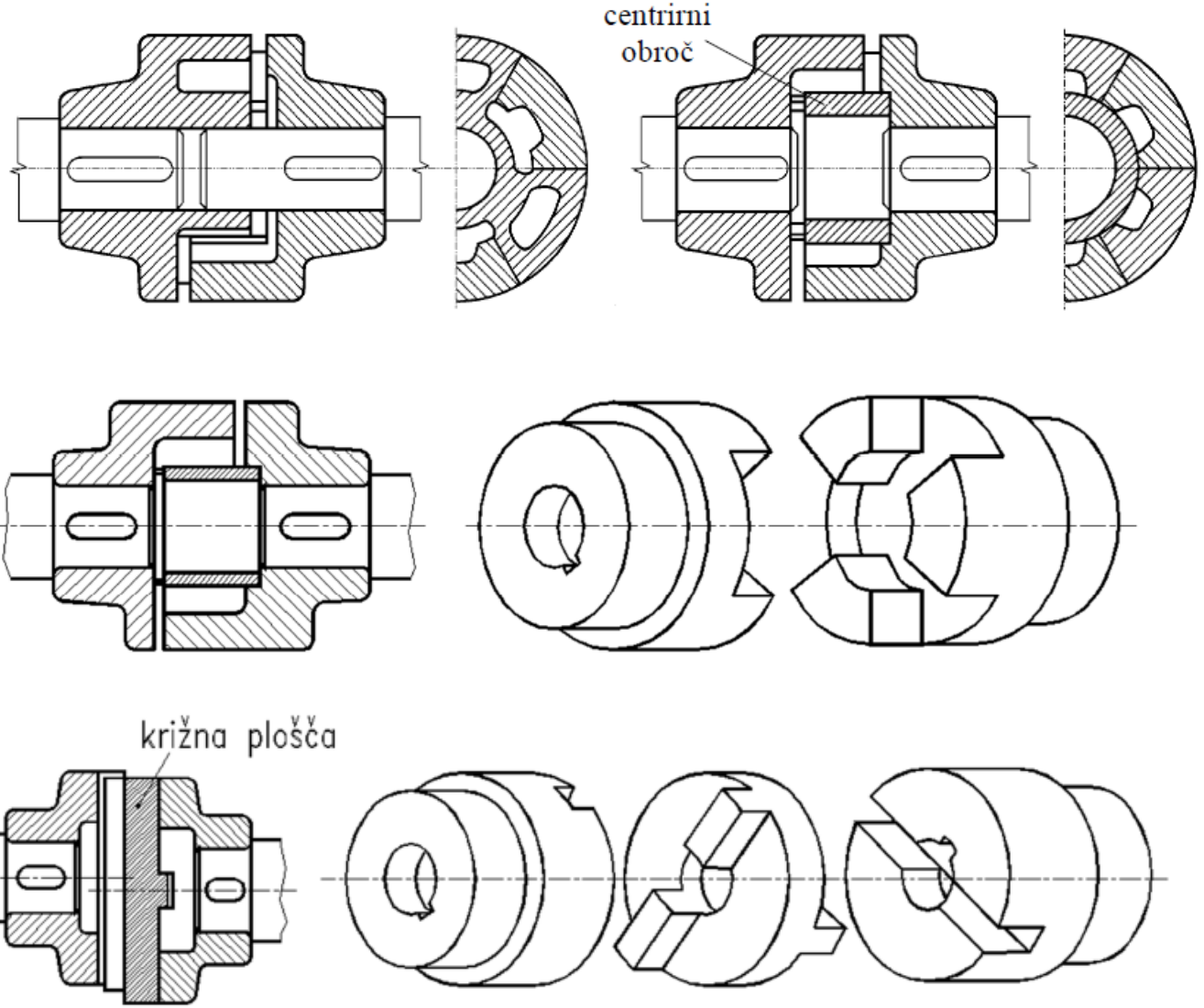
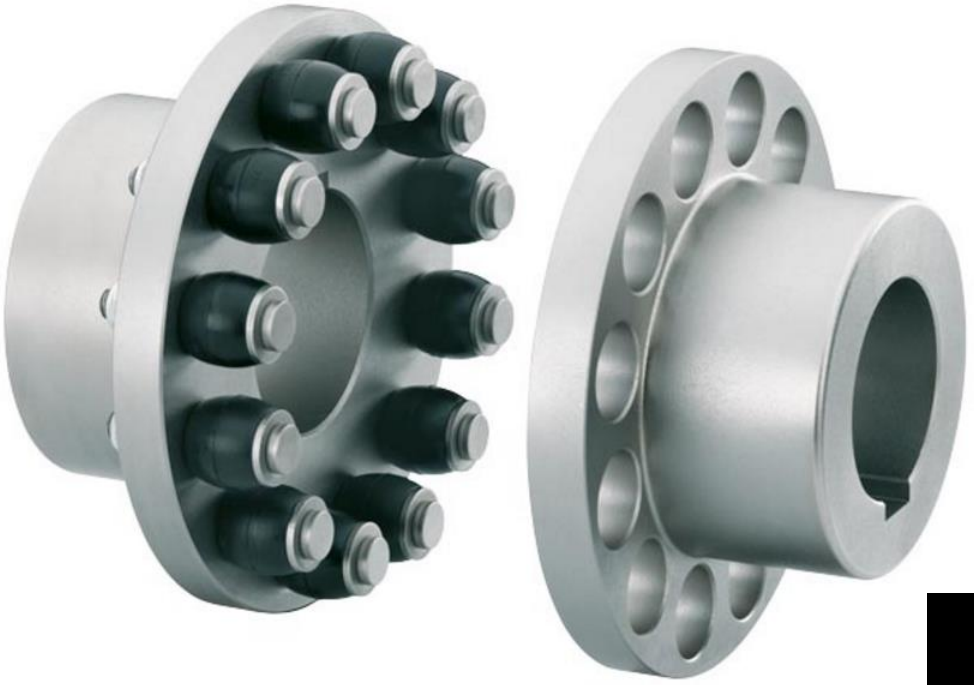


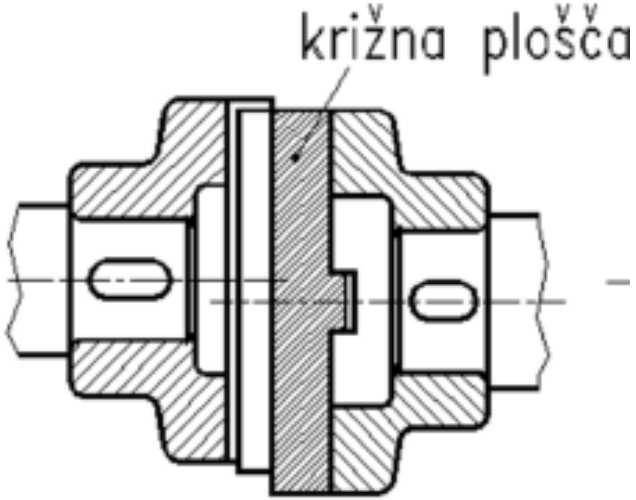
Figure 1— Types of coupling misalignment.

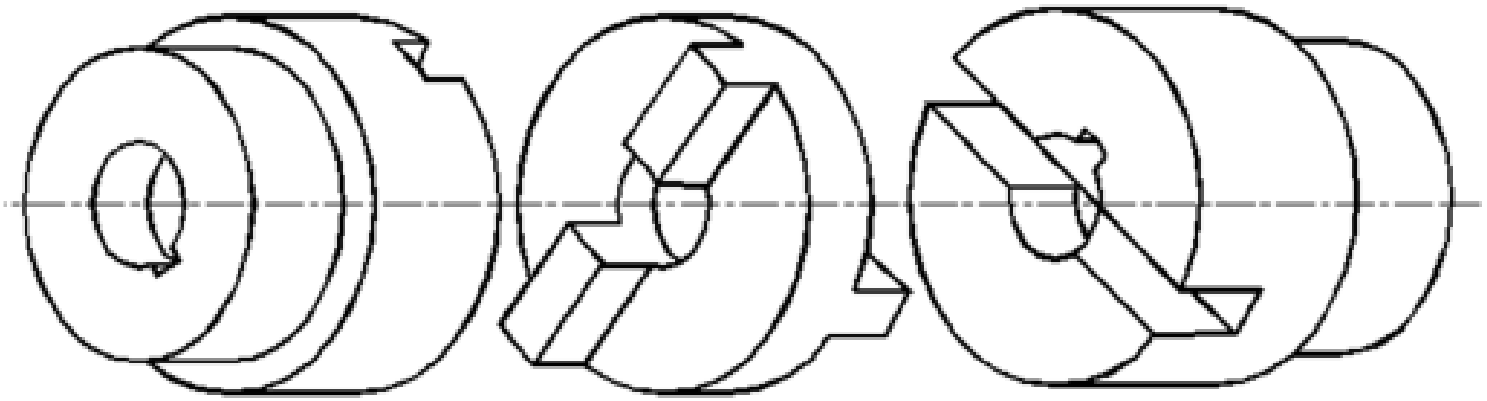
NEELASTIČNE IZRAVNALNE GREDNE VEZI

parkljasta gredna vez (izravnava premike gredi v aksialni smeri)

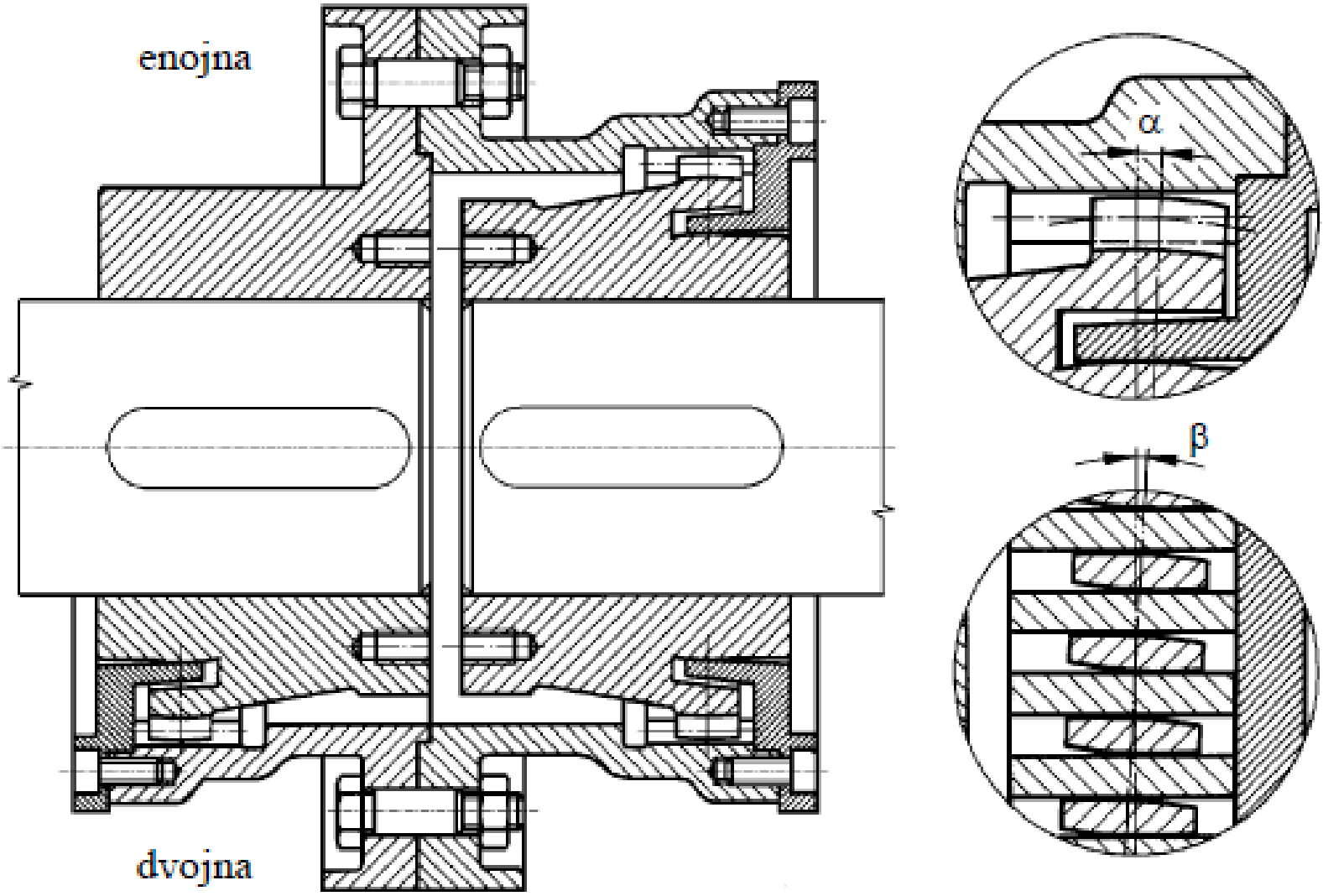


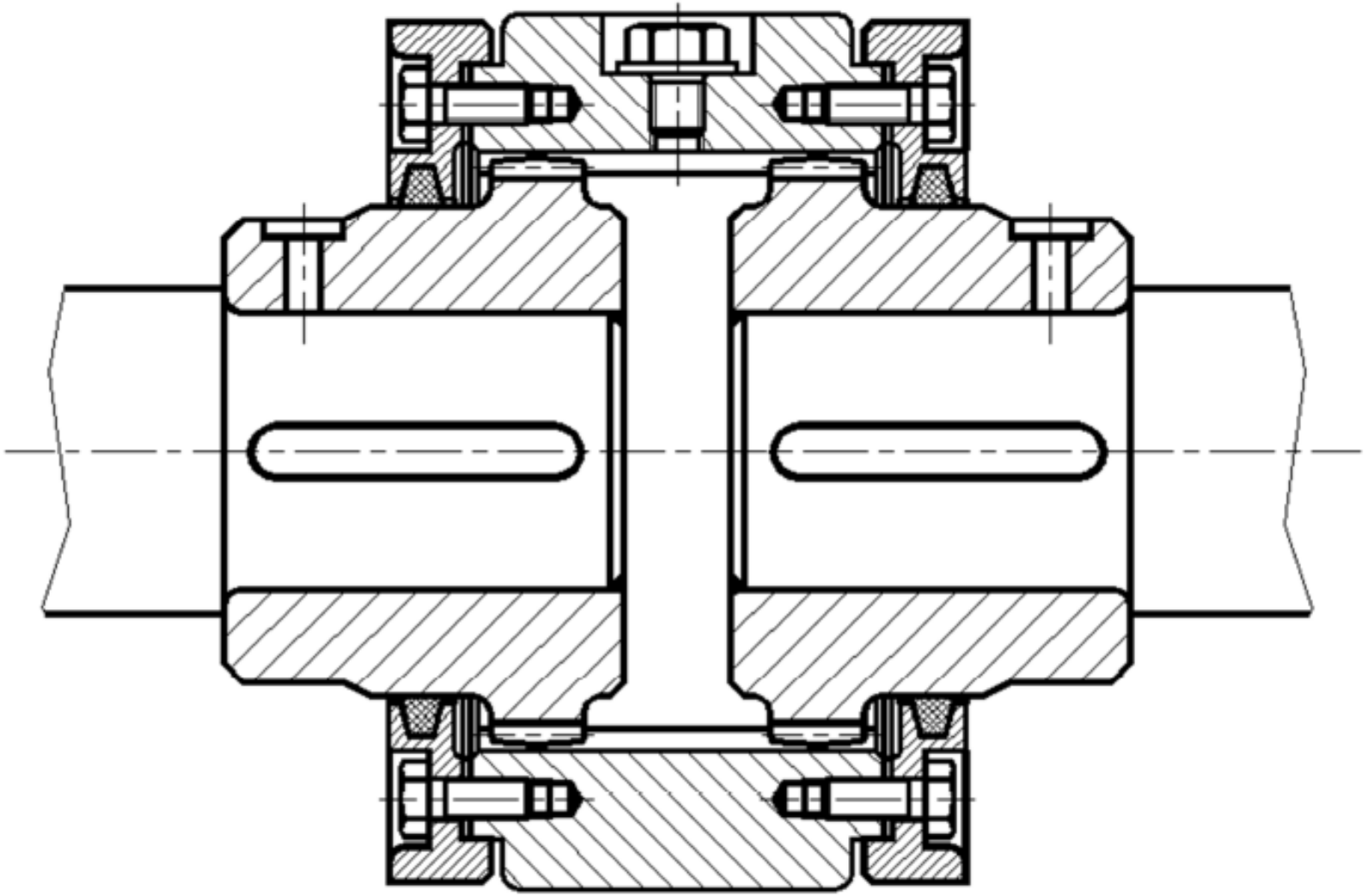



križna plošča



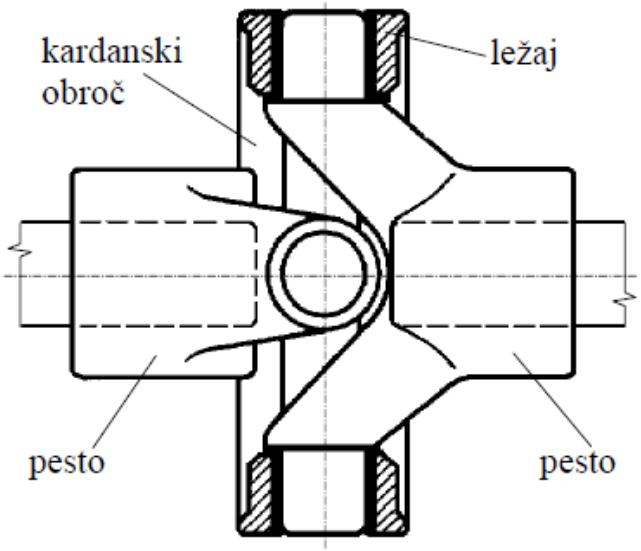
zobata gredna vez

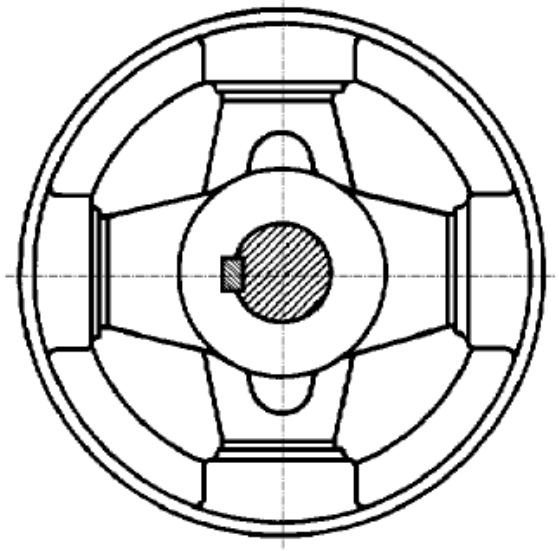




Dvojna zobata gredna vez

kardanski zglob (izravnava kotne premike gredi do 15° oziroma 30°)

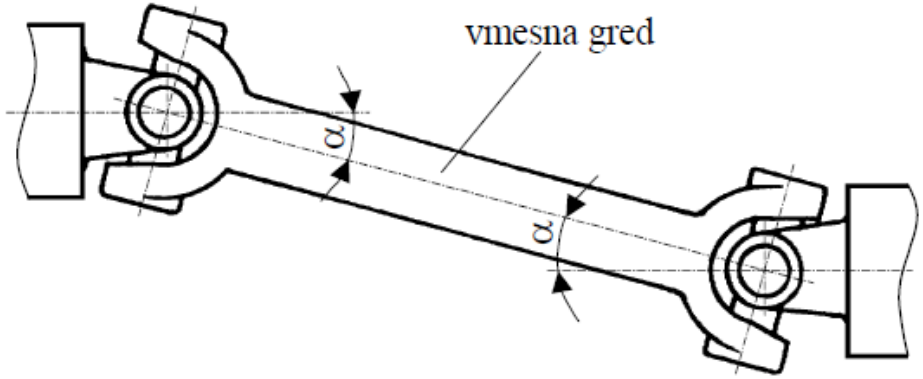


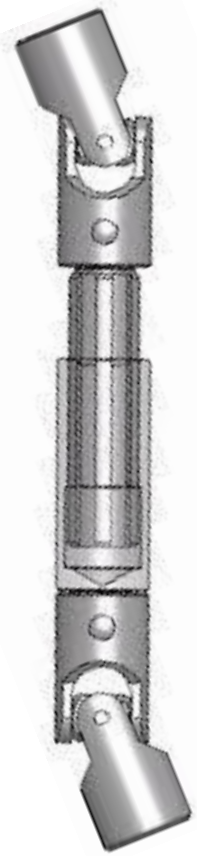


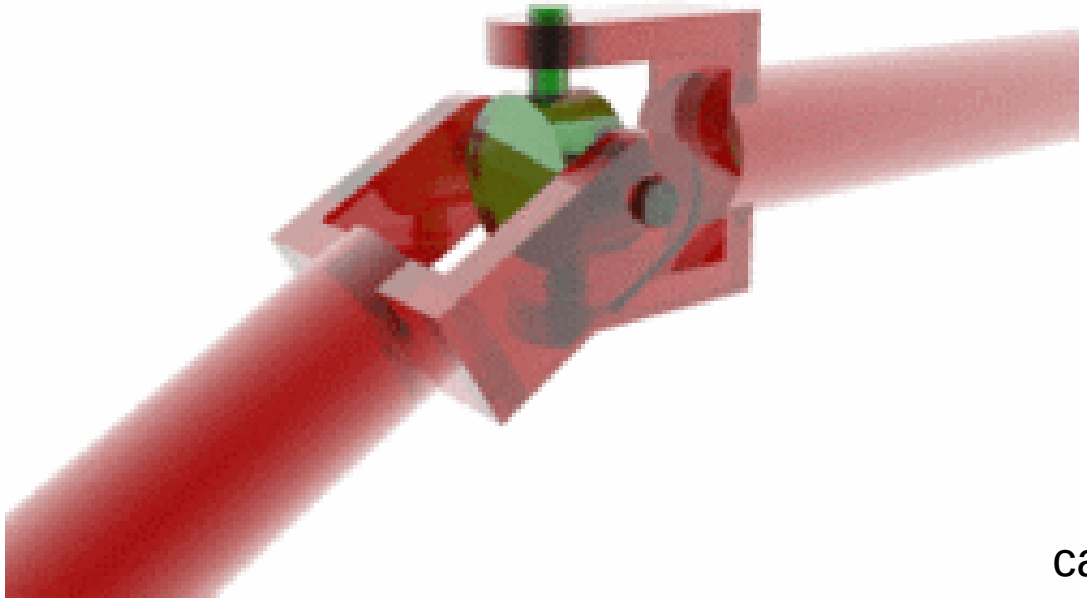
Neenakomernost vrtenja gnane gredi:

$$n_{\max} = \frac{n}{\cos\alpha}$$

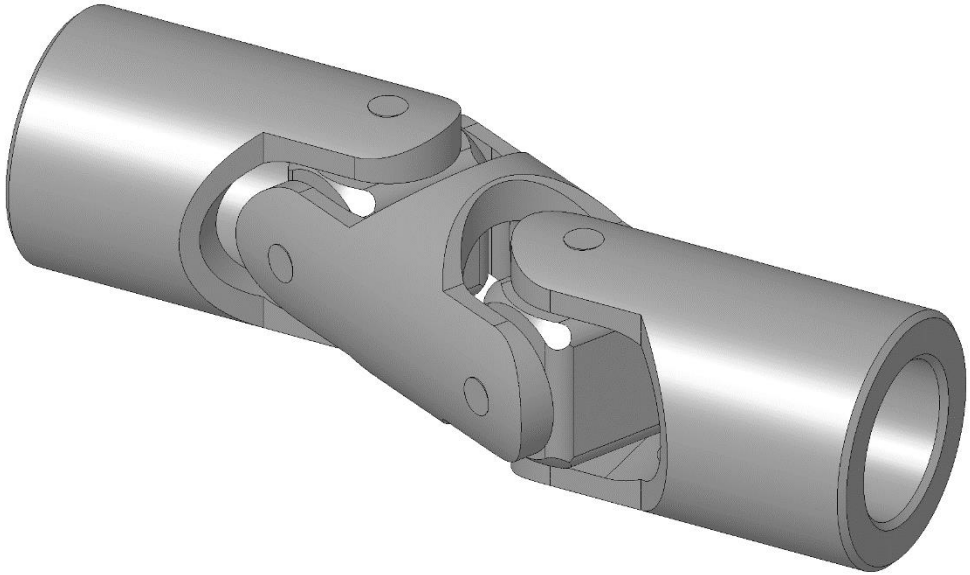
$$n_{\min} = n \cdot \cos\alpha$$

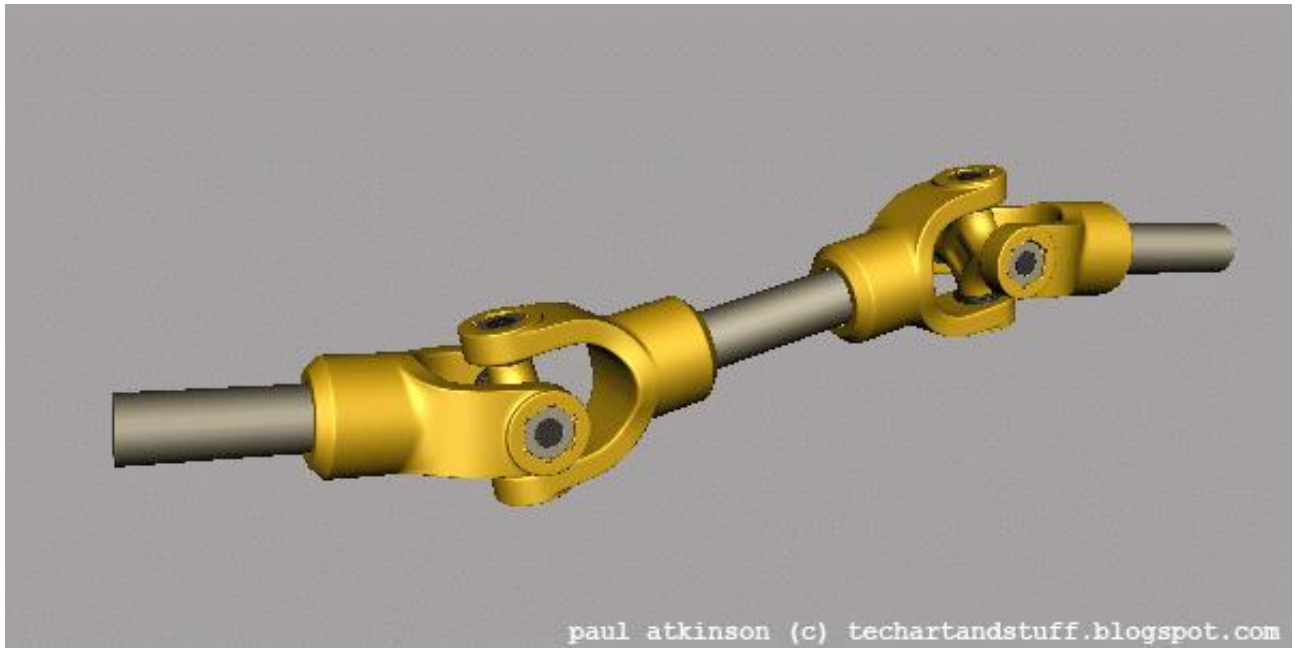


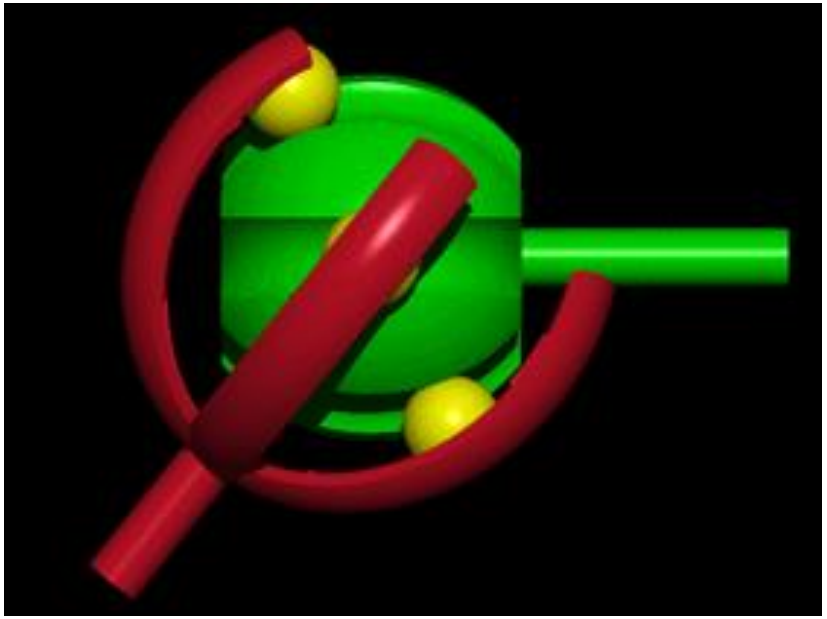


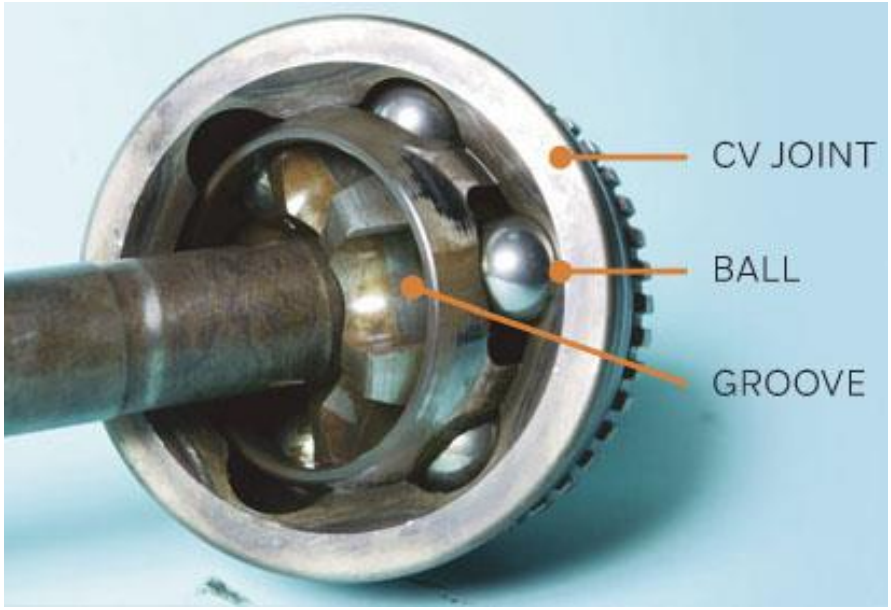


cardan joint




paul atkinson (c) techartandstuff.blogspot.com



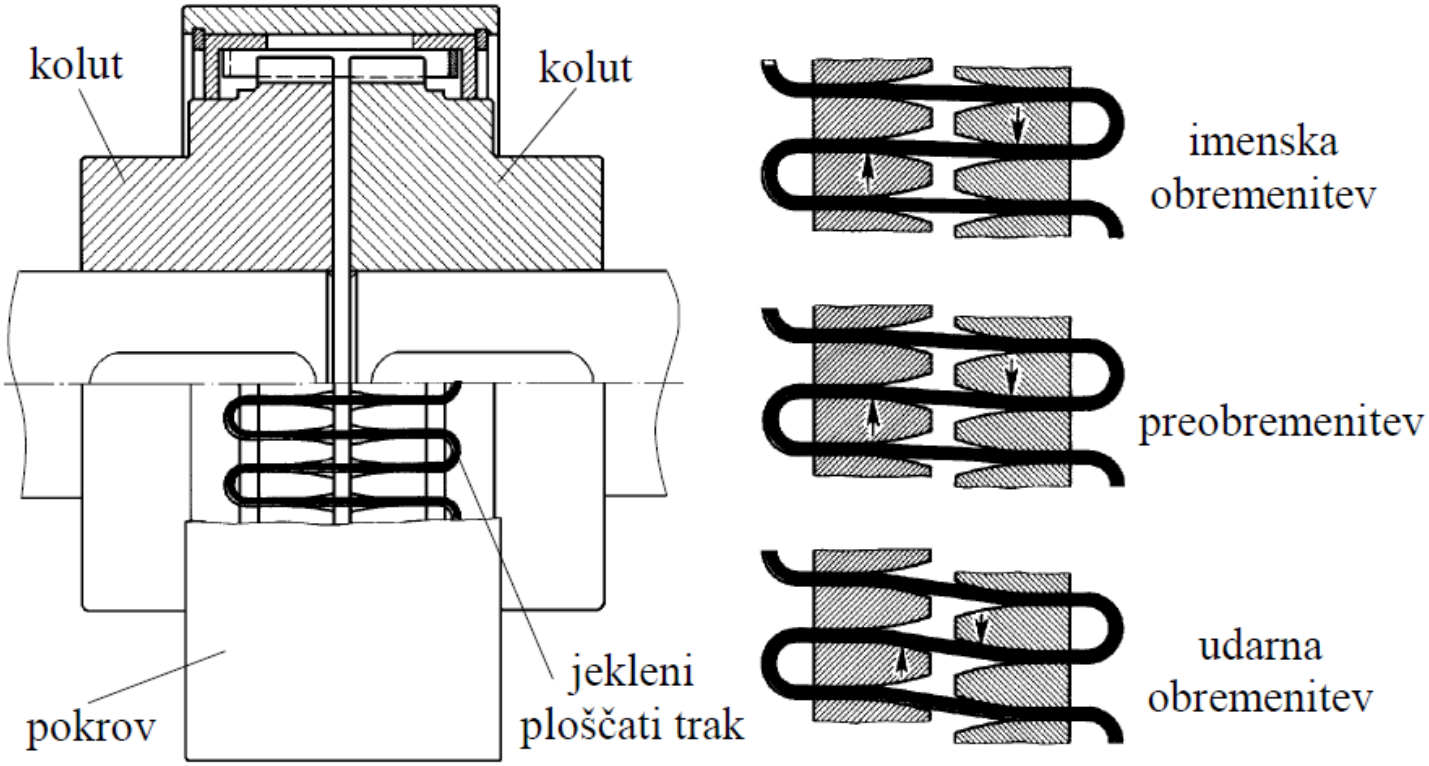

CV JOINT
BALL
GROOVE

ELASTIČNE IZRAVNALNE GREDNE VEZI

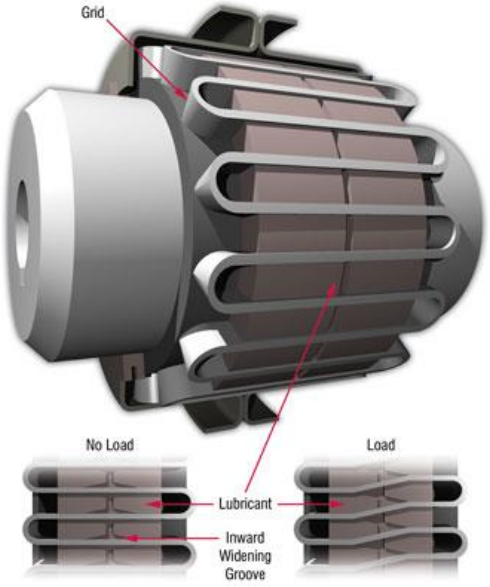
Elastische Kupplungen, flexible couplings

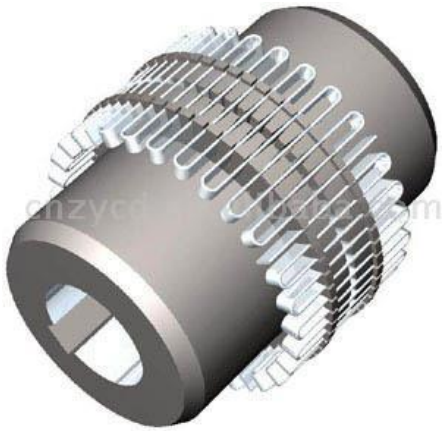
GREDNA VEZ S TRAČNO VZMETJO - BIBBY

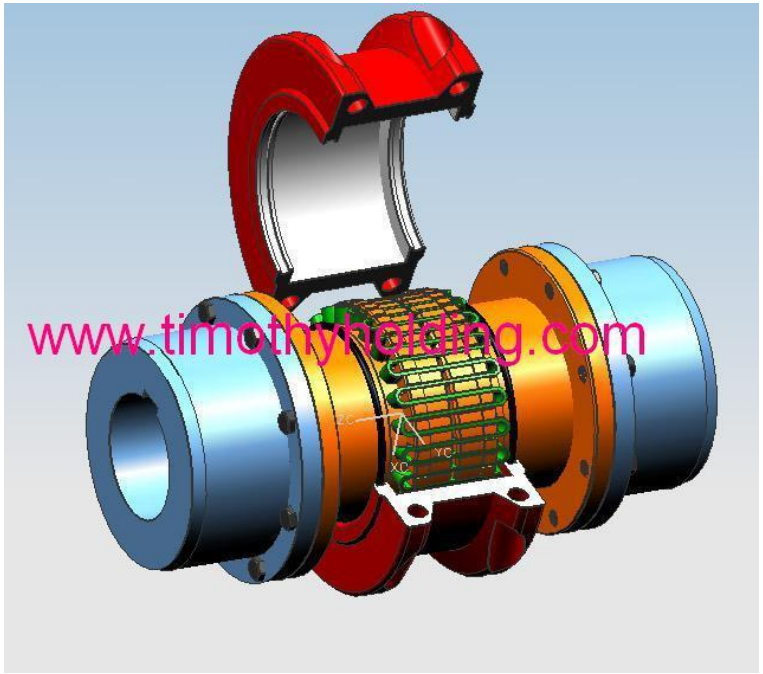
gredna vez z jeklenimi trakovi



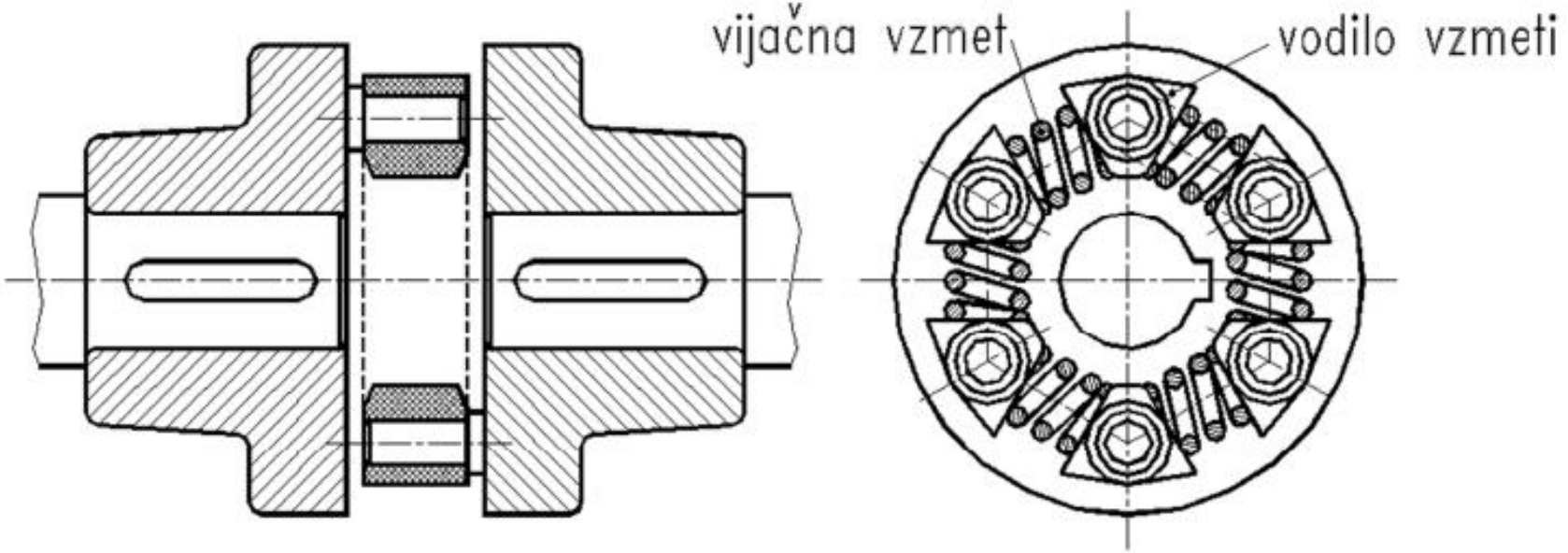
(izravnava vzdolžne premike gredi od 4 do 20 mm, prečne premike gredi od 0,5 do 3 mm, kotne premike gredi do 1,3° ter zasuke gredi do 1,2°)

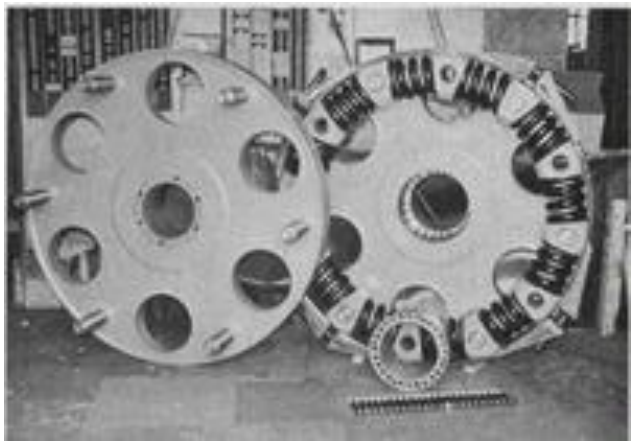

Grid
No Load
Load
Lubricant
Inward
Widening
Groove

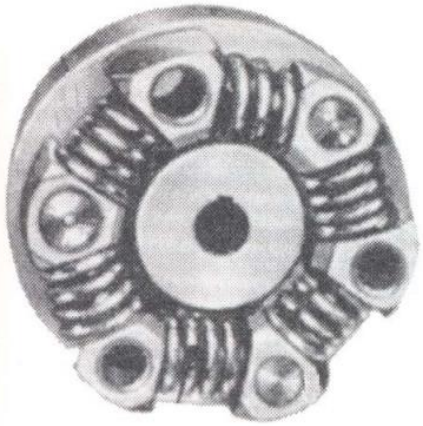


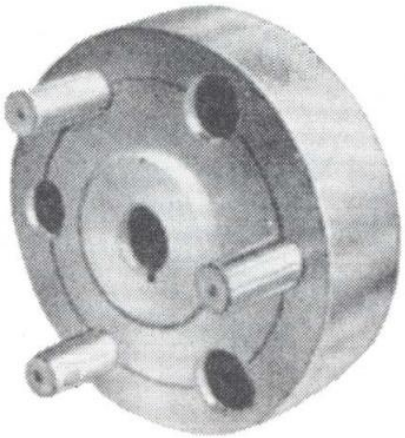

www.timothyholding.com

GREDNA VEZ S TORZIJSKO VIJAČNO VZMETJO - CARDEFLEX



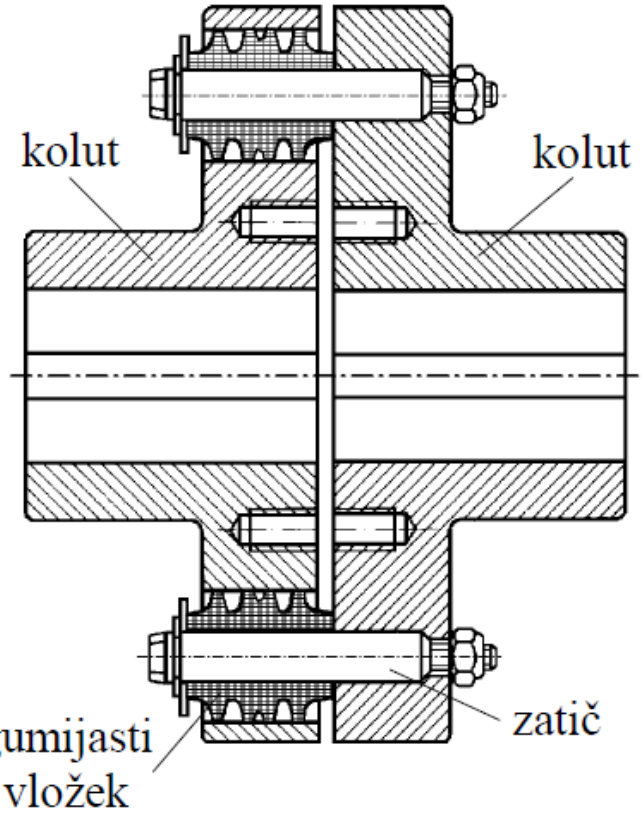


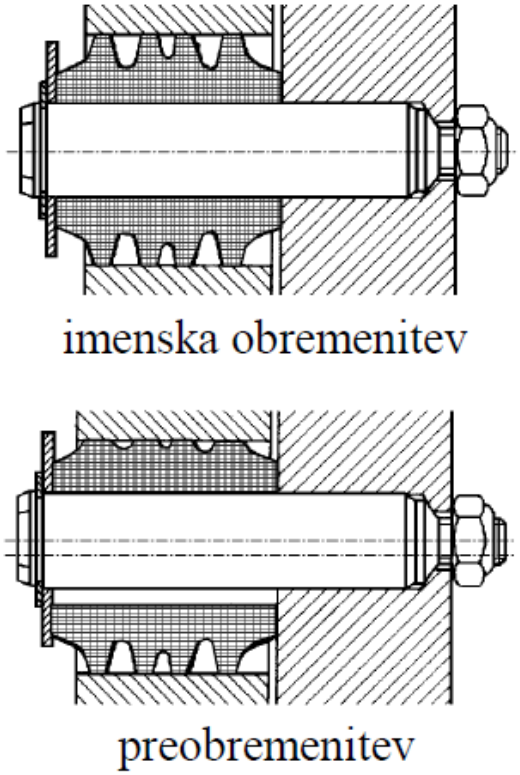




ELASTIČNA KOLUTNA GREDNA VEZ

gredna vez z gumijastimi vložki

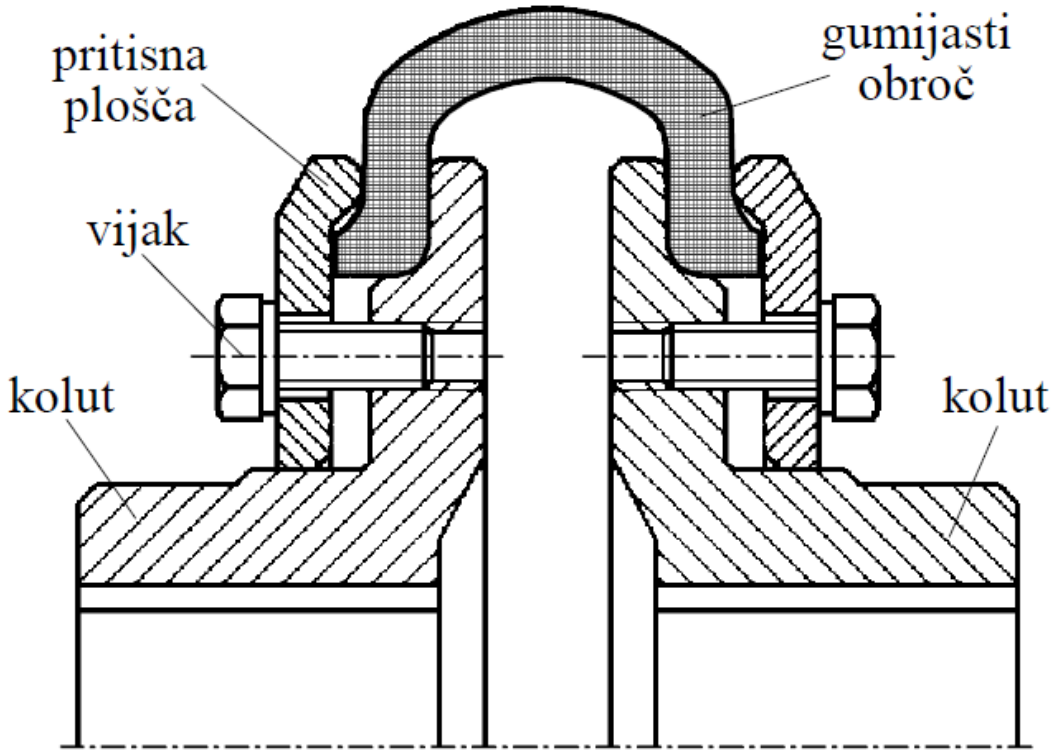




(izravnava vzdolžne premike gredi do 3 mm, majhne prečne in kotne premike gredi ter zasuke gredi pa do 3°)

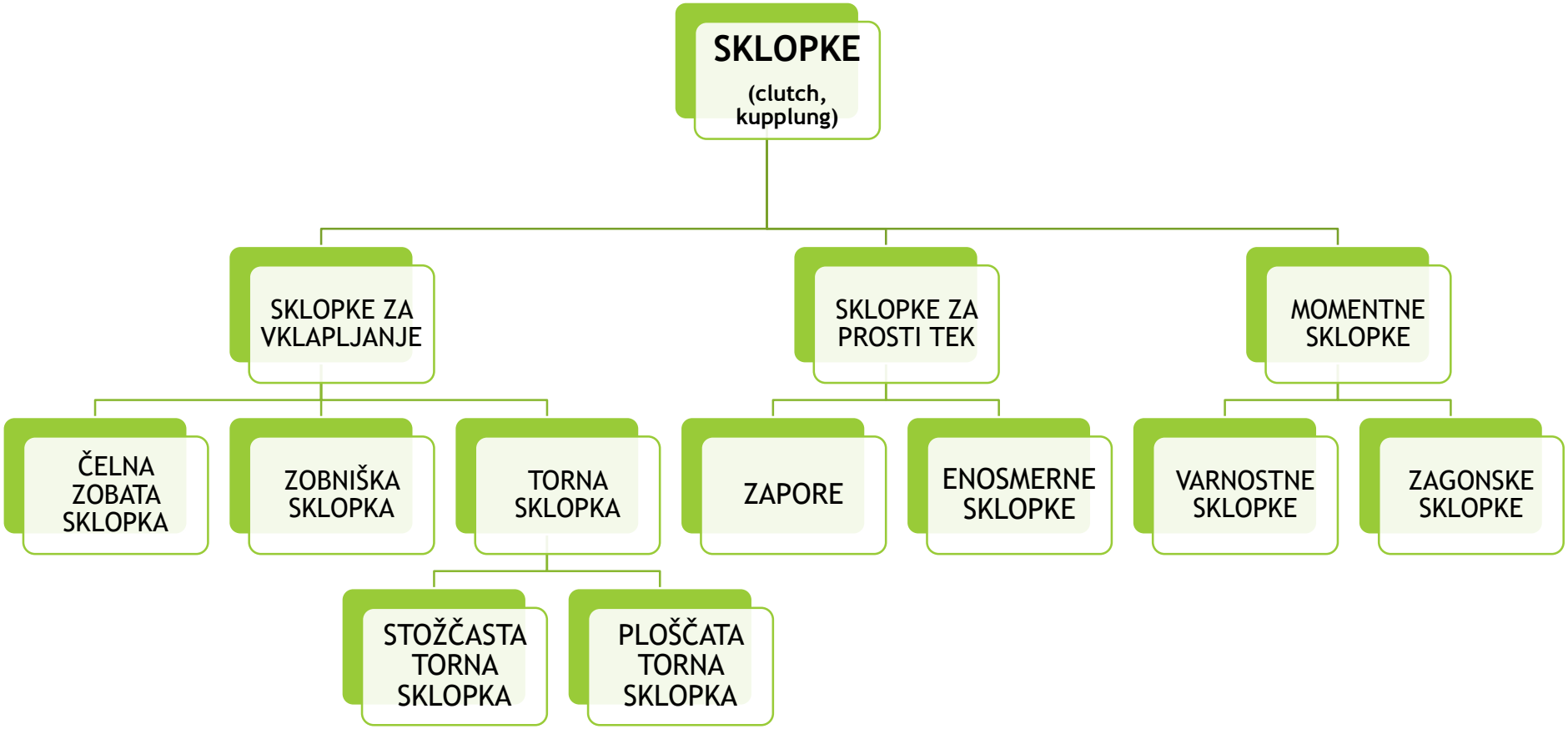
PERIFLEX

gredna vez z gumijastim obročem



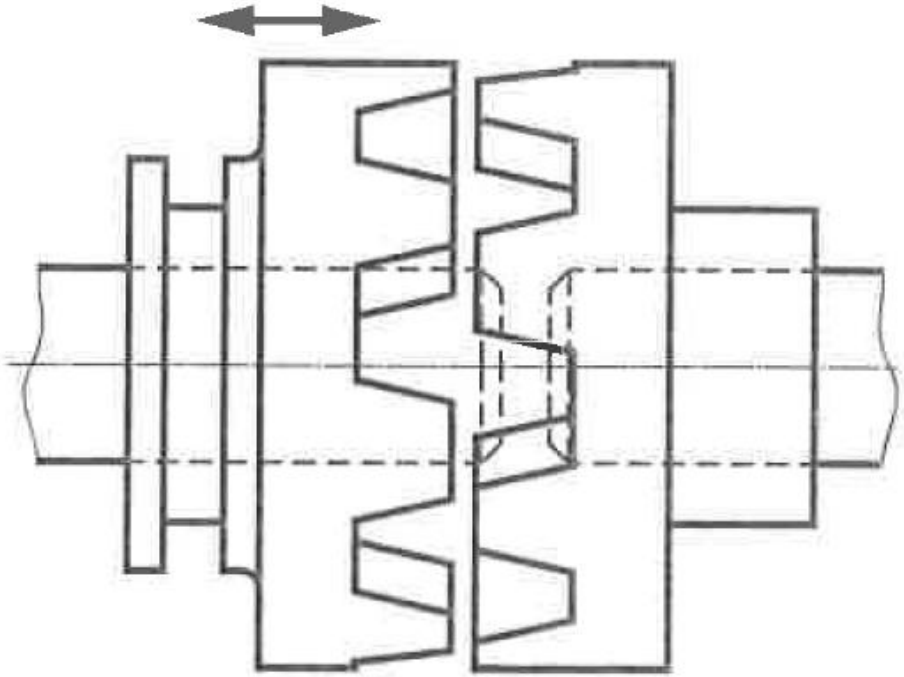
(izravnava vzdolžne premike gredi do 8 mm, prečne premike gredi do 4 mm, kotne premike gredi do 4° ter zasuke gredi do 12°)

SKLOPKE

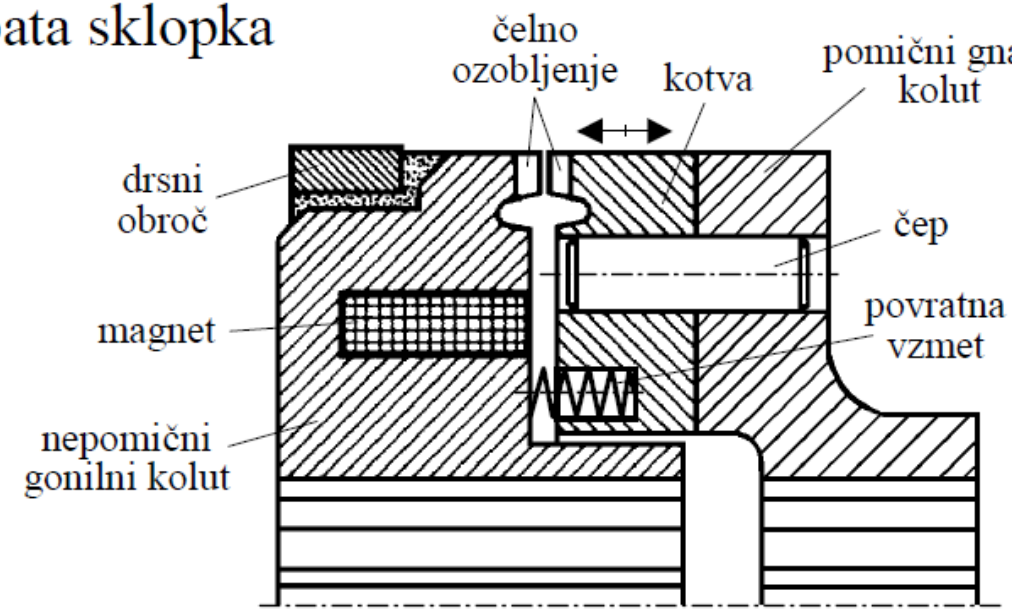

SKLOPKE
(clutch, kupplung)
SKLOPKE ZA VKLAPLJANJE
SKLOPKE ZA PROSTI TEK
MOMENTNE SKLOPKE
ČELNA ZOBATA SKLOPKA
ZOBNIŠKA SKLOPKA
TORNA SKLOPKA
ZAPORE
ENOSMERNE SKLOPKE
VARNOSTNE SKLOPKE
ZAGONSKE SKLOPKE
STOŽČASTA TORNA SKLOPKA
PLOŠČATA TORNA SKLOPKA

SKLOPKE ZA VKLAPLJANJE

ČELNA ZOBATA SKLOPKA

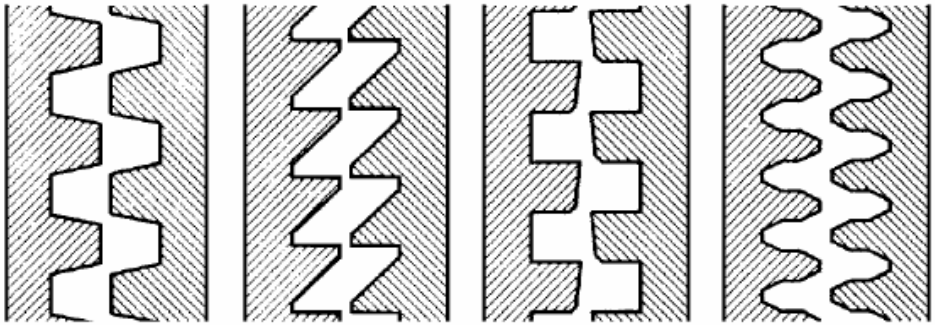


- čelna zobata sklopka

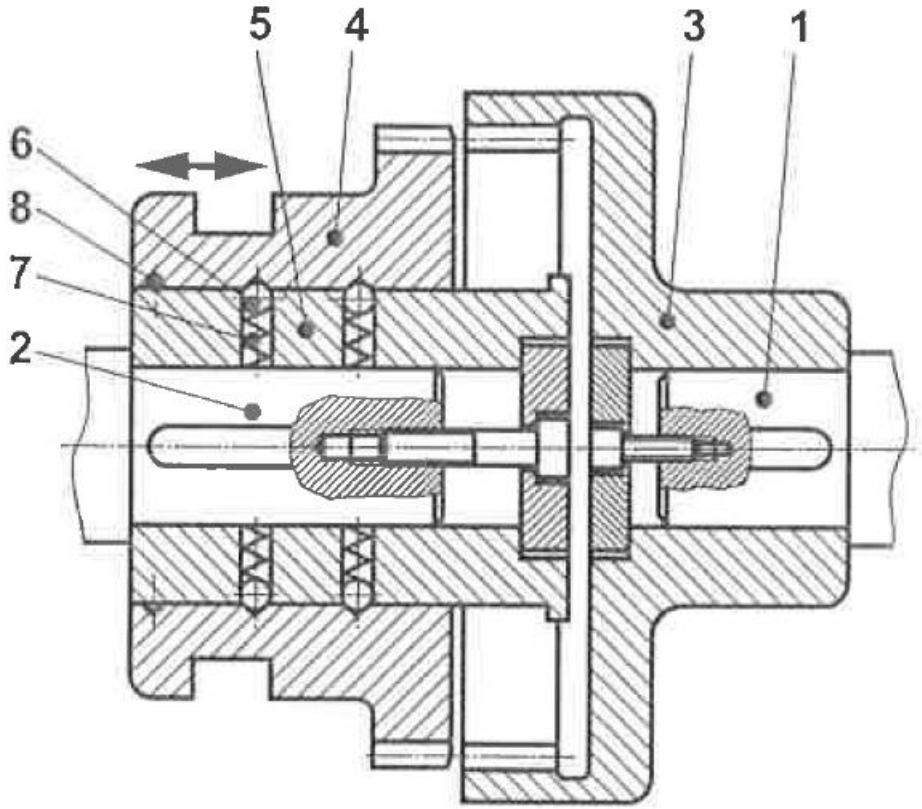


elektromagnetna
čelna zobata sklopka

Vrste čelnega ozobja: trapezno žagasto pravokotno trikotno

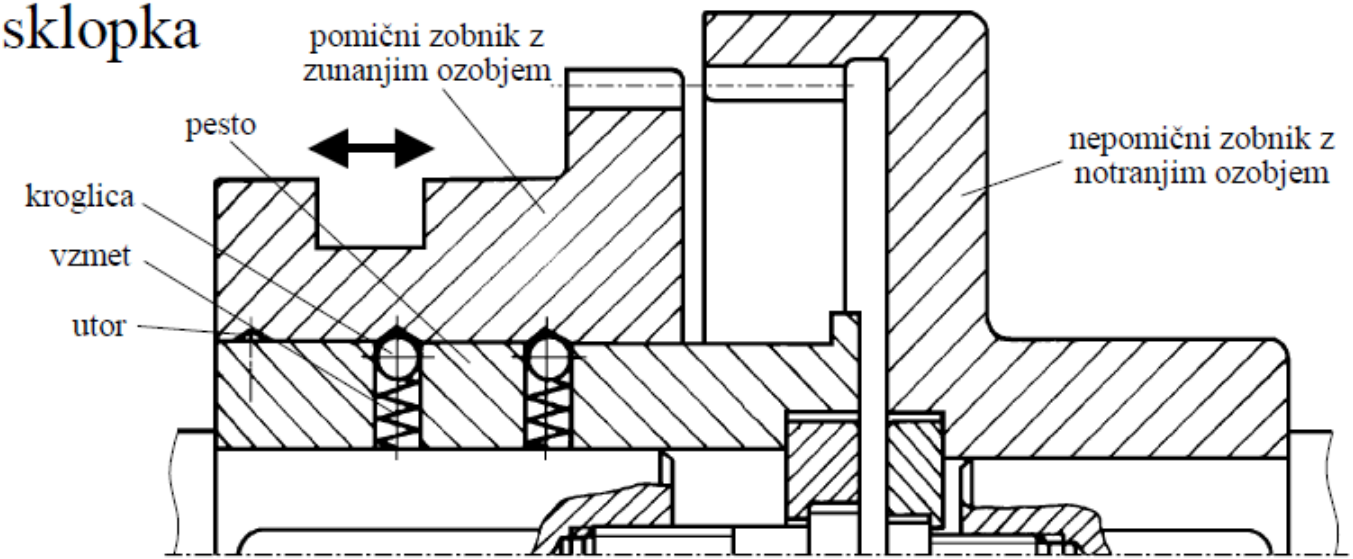


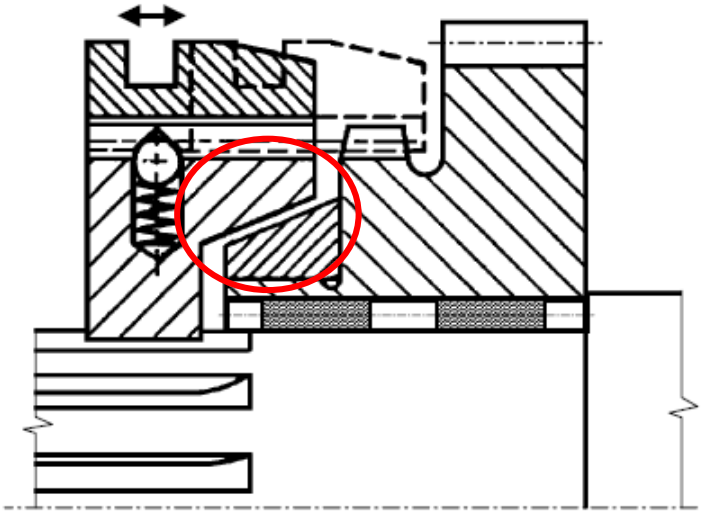
ZOBNIŠKA SKLOPKA



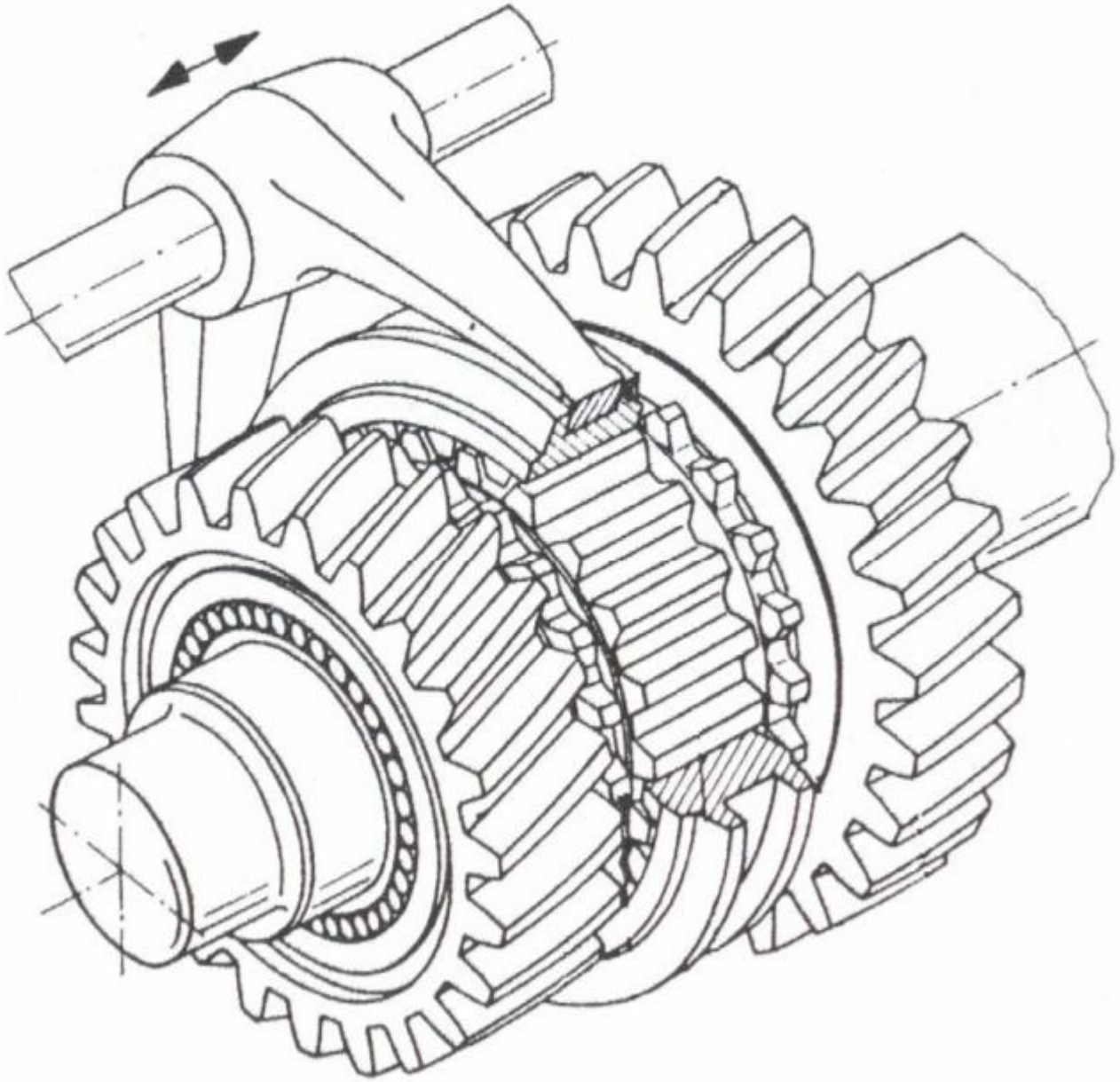
1 – gonilna gred
2 – gnana gred
3 – gnani zobnik
4 – gonilni zobnik
5 – pesto na gonilni gredi
6 – kroglica
7 – vzmet
8 – utor na zobniku

- zobniška sklopka





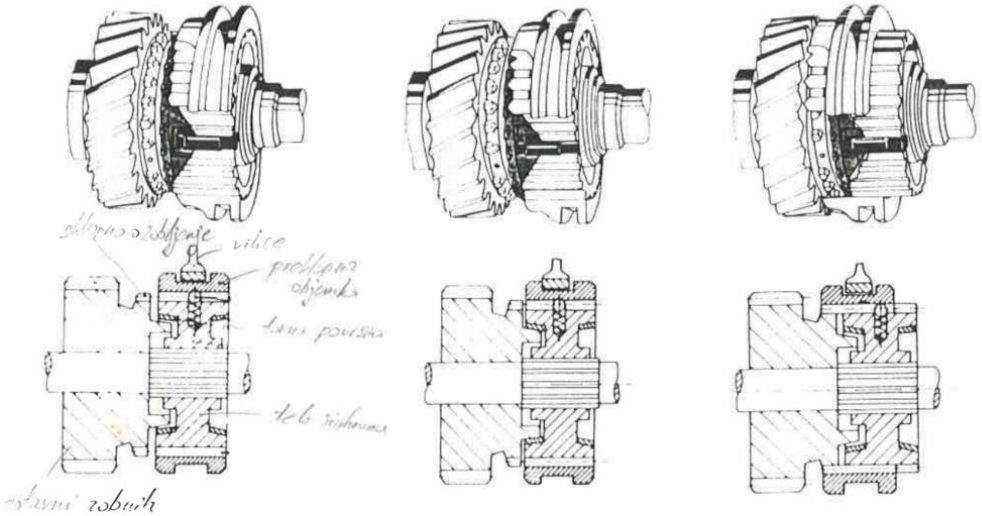
zobniška sklopka s
sinhronim vklapljanjem



SINHRONSKA NAPRAVA

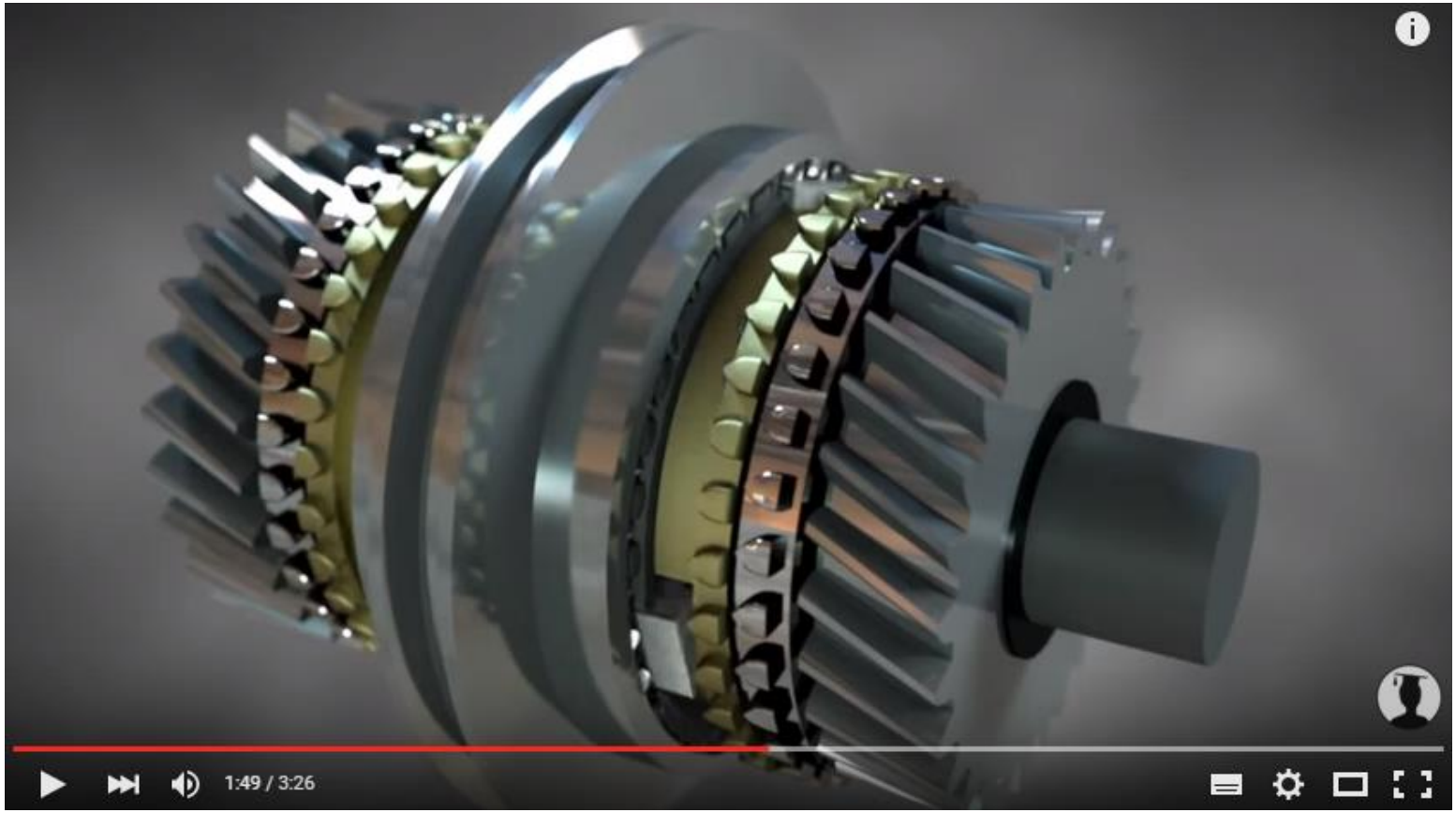
Zobnik, ki ga vključimo, ima stožec, ki se vrine v stožčasto vdolbino menjalne puše, na kateri je zobati obroč. Pri vklapljanju prestave se premakne menjalna puša z notranjim ozobljenjem proti zobniku, ki ga vključujemo. S tem vklapljamo sklopko, ki spravlja oba dela na enako vrtilno hitrost. Ko se hitrosti izenačita, se zobati obroč premakne dalje in vprime v zunanje ozobčenje zobnika. Proti samodejnemu premiku je menjalna puša zavarovana s kroglicami in vzmetmi. Tako je dosežena trdna zveza med prostim zobnikom in gredjo (slika 7.8).

Lamelni sinhron sestavljajo lamele, polovica lamel je v prostih zobnikih, polovica na gredi. Pri vklapljanju stisne menjalna puša lamele skupaj in pri tem nastaja sila, ki izenačuje hitrosti hitrejšega in počasnejšega dela, kar omogoča vklop podobno, kot smo že prej opisali.



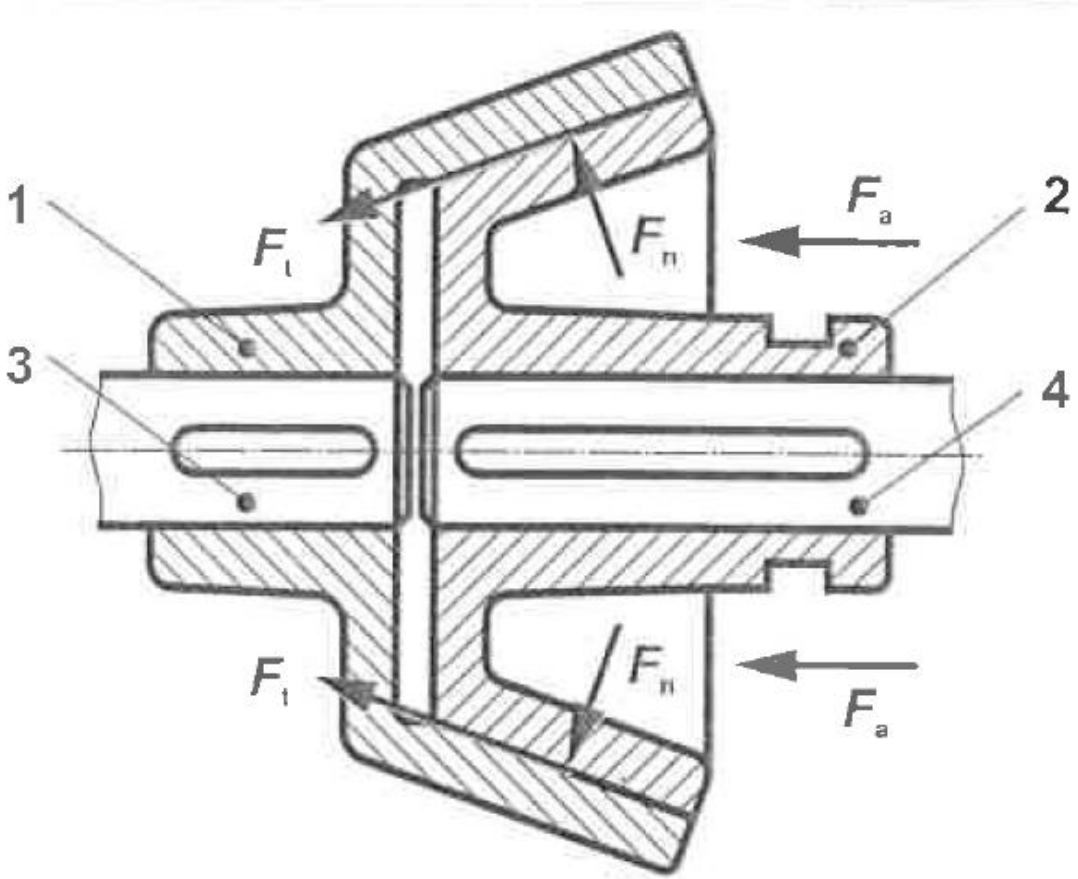
Slika 7.8: Sinhronski vklop zobnikov

SINHRONSKA NAPRAVA



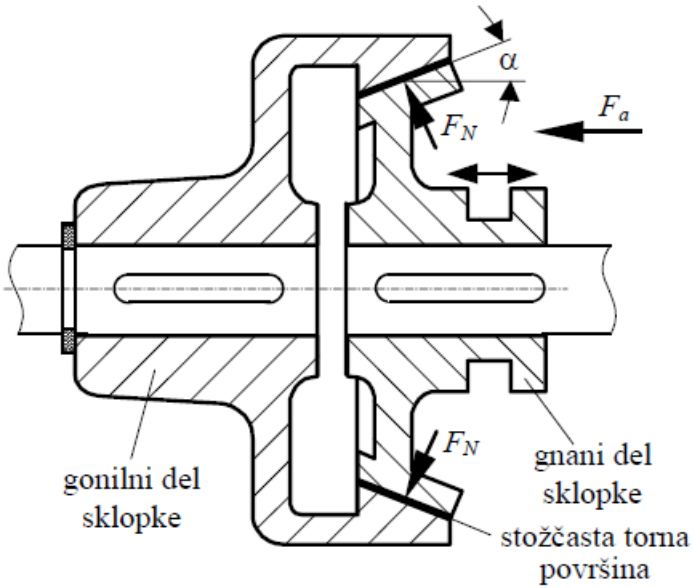
https://www.youtube.com/watch?v=I4AaJ_FpzEE
https://www.youtube.com/watch?v=0bq-WcRK1Bk

STOŽČASTA TORNA SKLOPKA

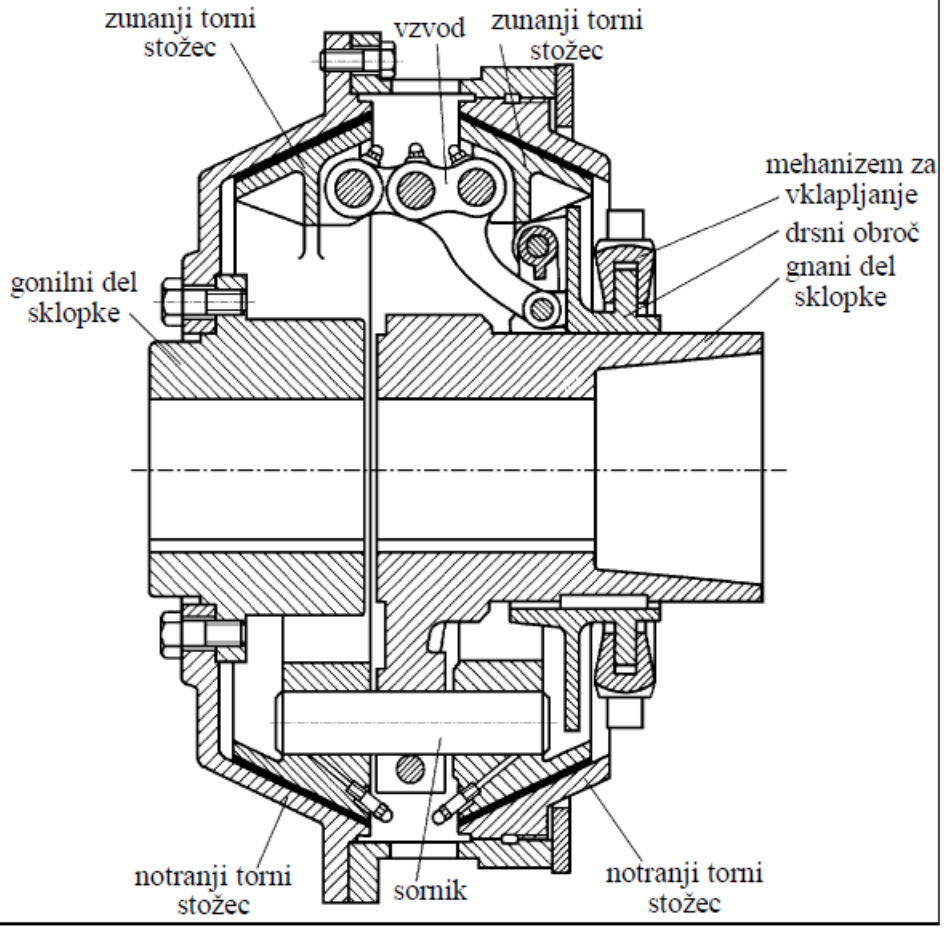


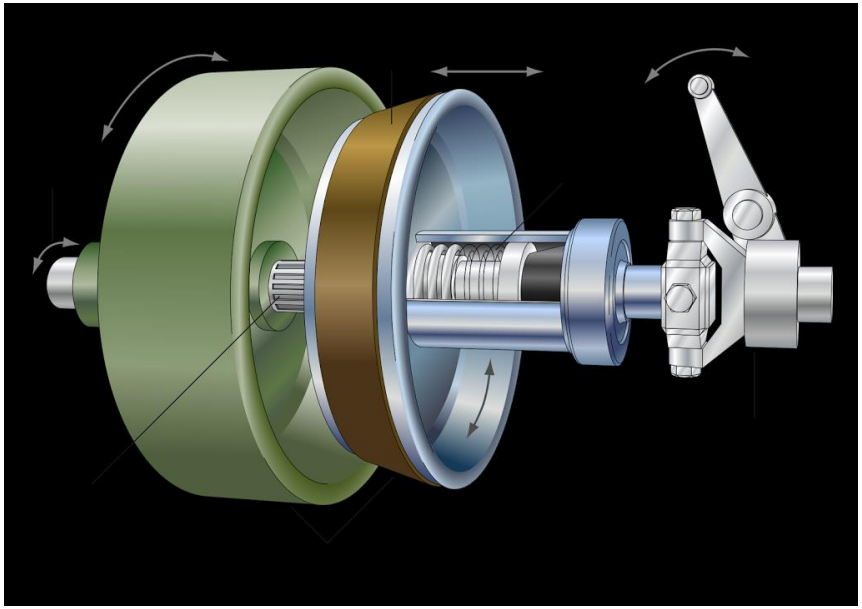
1 – gonilna gred
2 – gnana gred
3 – gonilni del sklopke
4 – gnani del sklopke

- enojna stožčasta torna sklopka

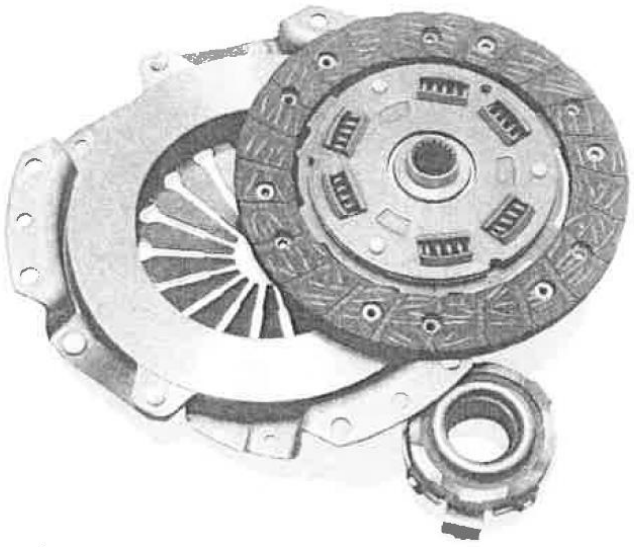


- dvojna stožčasta torna sklopka





PLOŠČATA (LAMELNA) TORNA SKLOPKA



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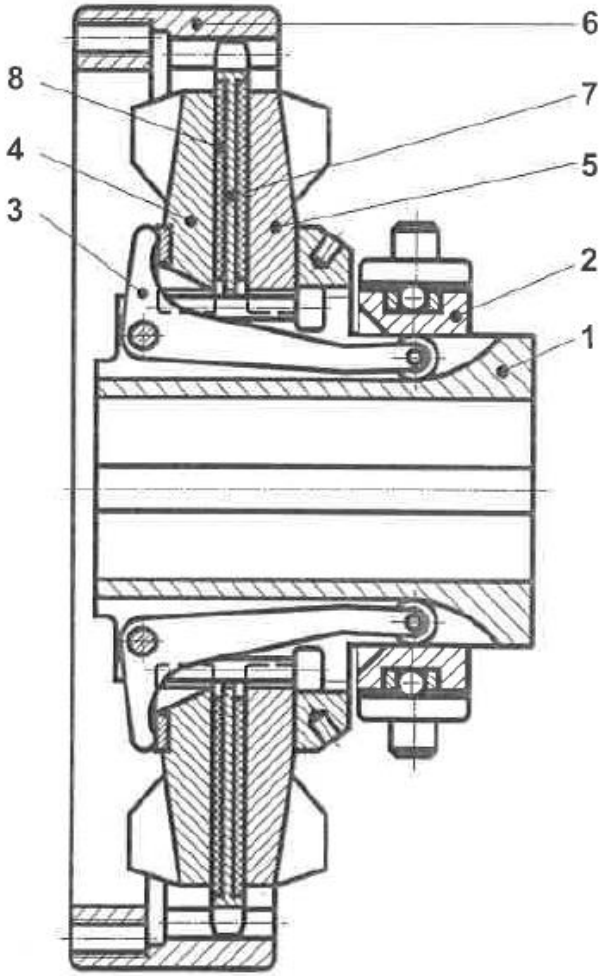
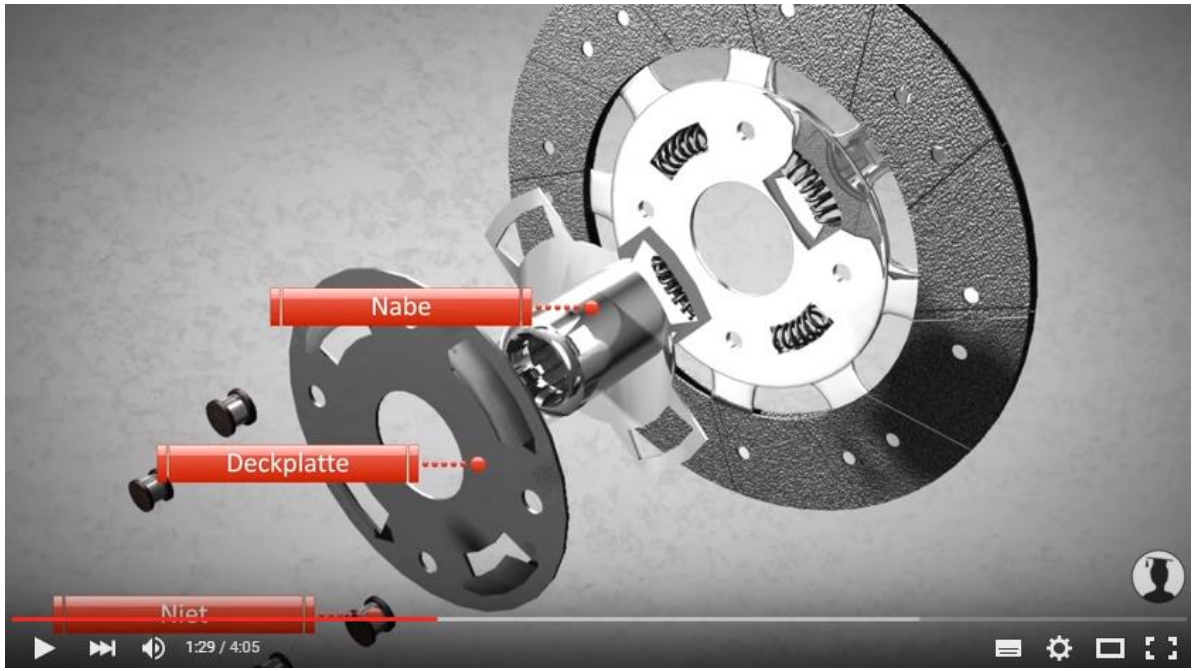


1 – pesto
2 – obroč za vklapljanje
3 – kljunasti vzvod
4 – potisna plošča
5 – torna plošča
6 – utor na pestu
7 – lamela
8 – torna obloga

PLOŠČATA (ENOLAMELNA) TORNA SKLOPKA

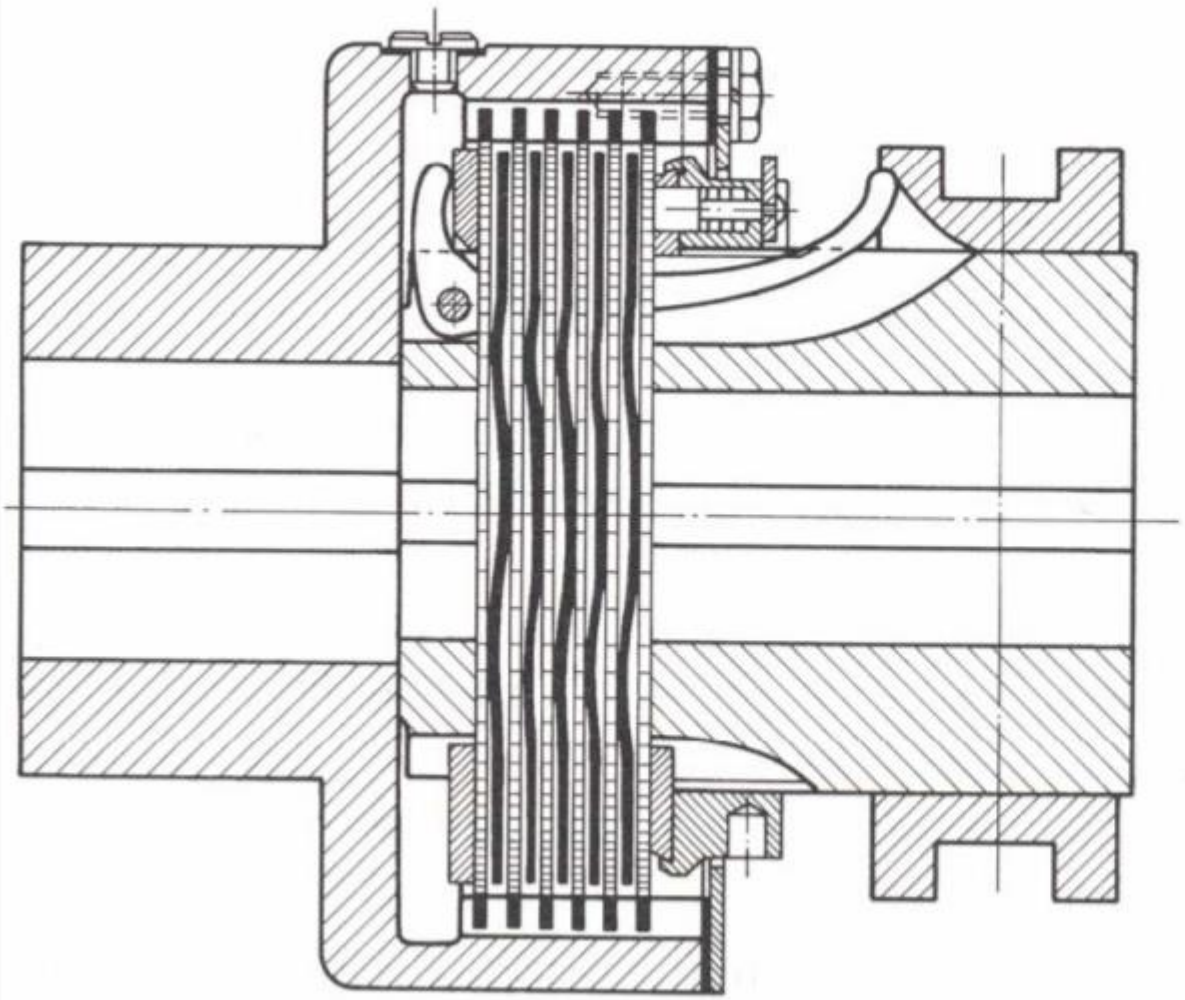


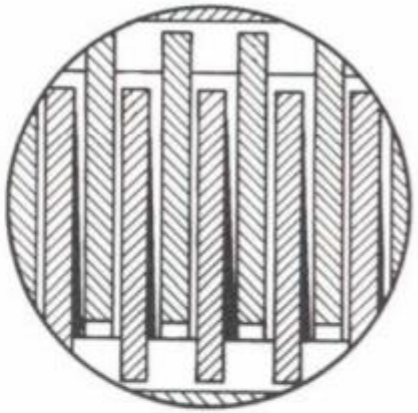
https://www.youtube.com/watch?v=pqF-aBtTBnY

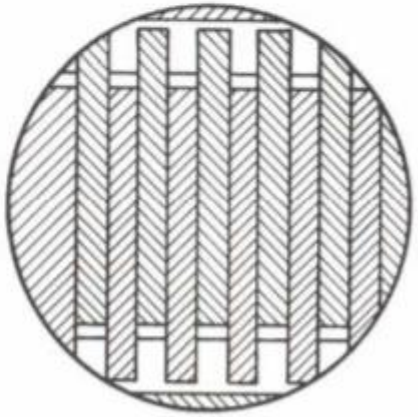
https://www.youtube.com/watch?v=Mj38Ficw2S0

PLOŠČATA (VEČLAMELNA) TORNA SKLOPKA

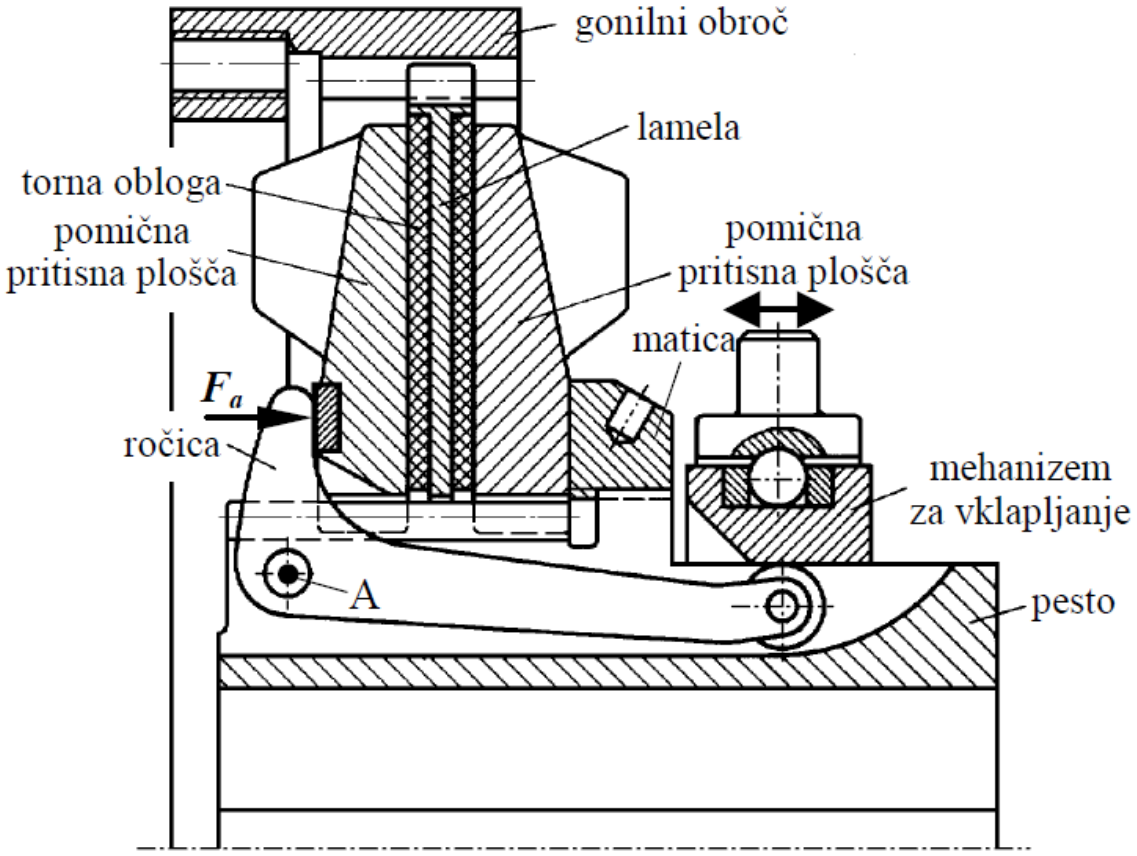
https://www.youtube.com/watch?v=XjWrVOMkCBc



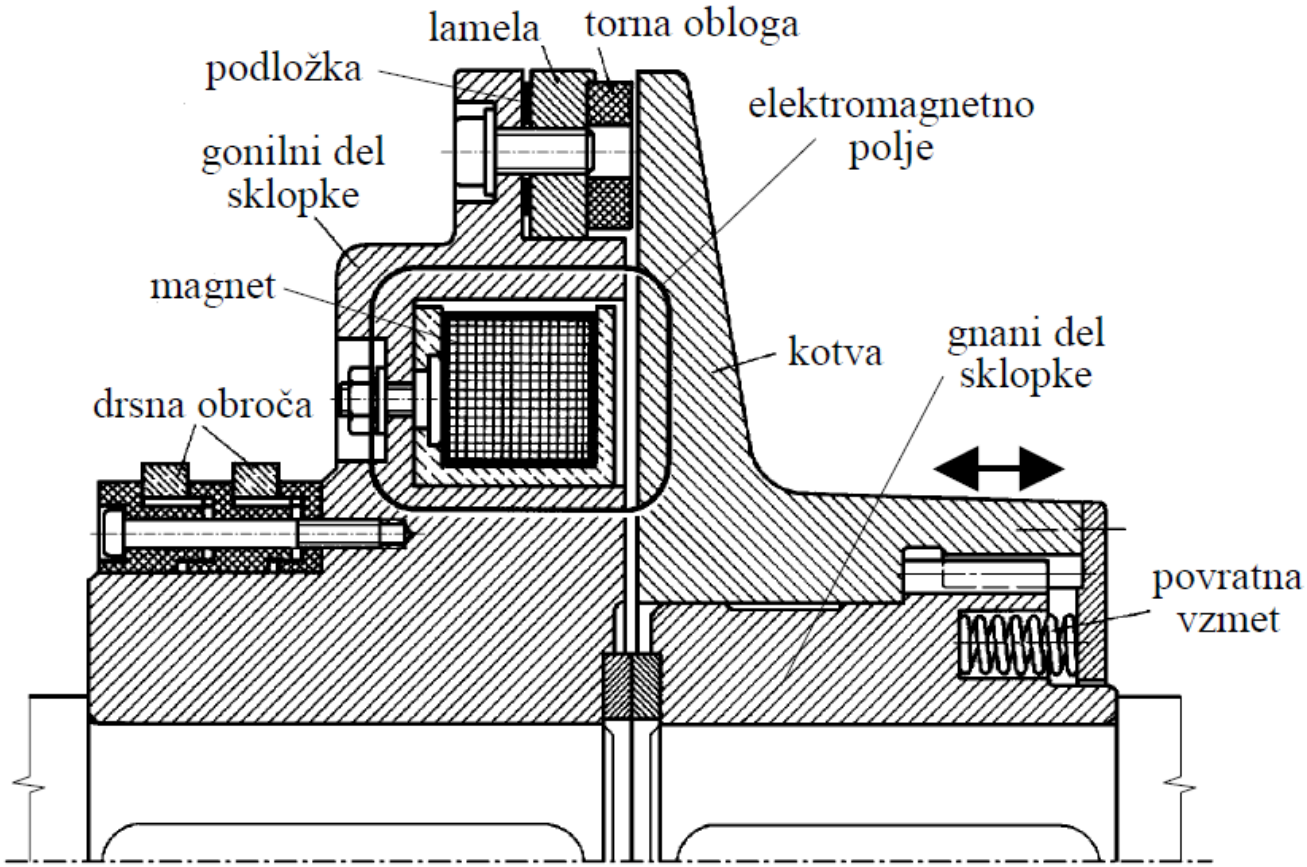




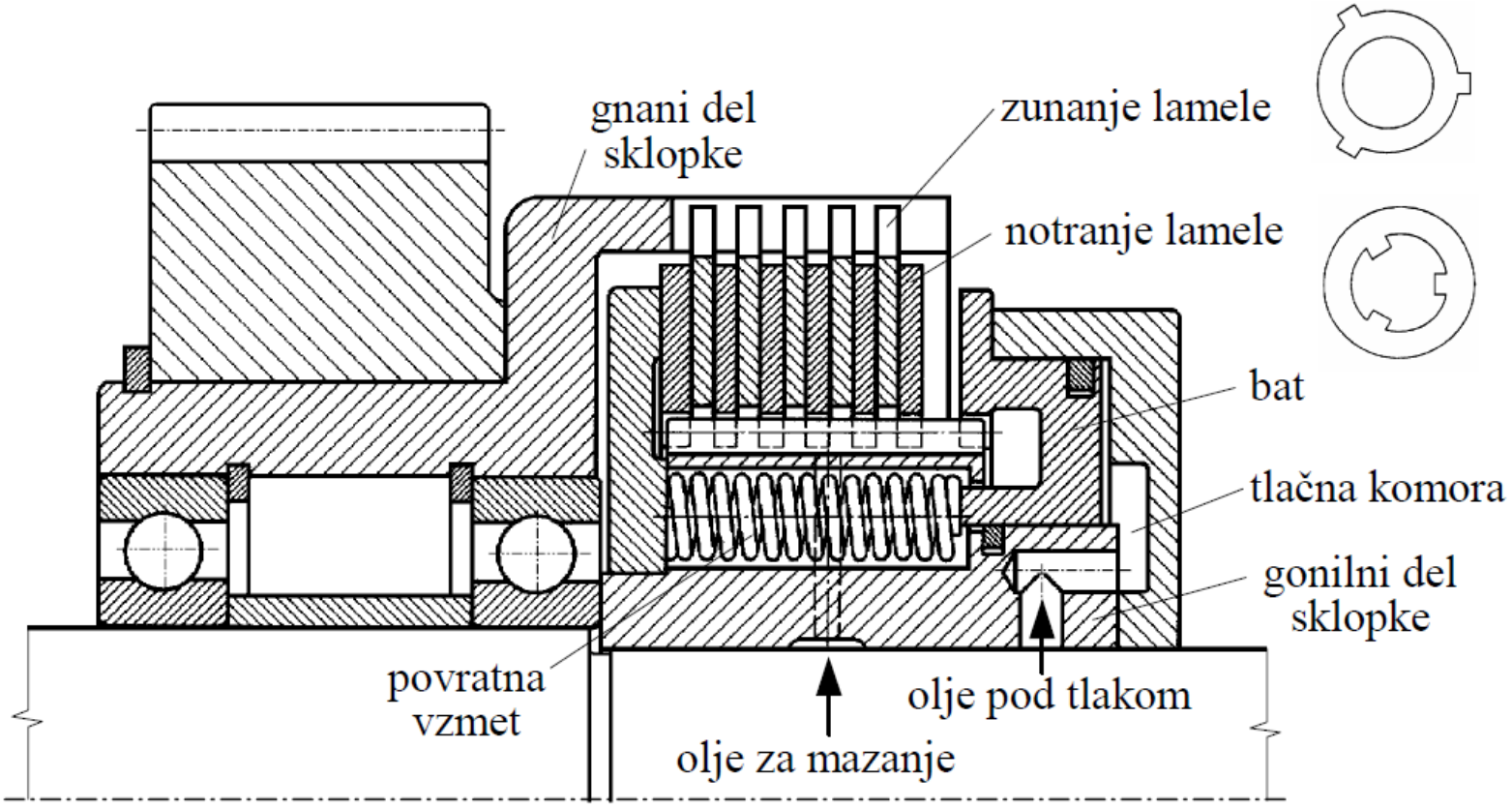
- enolamelna ploščata torna sklopka z mehanskim vklapljanjem



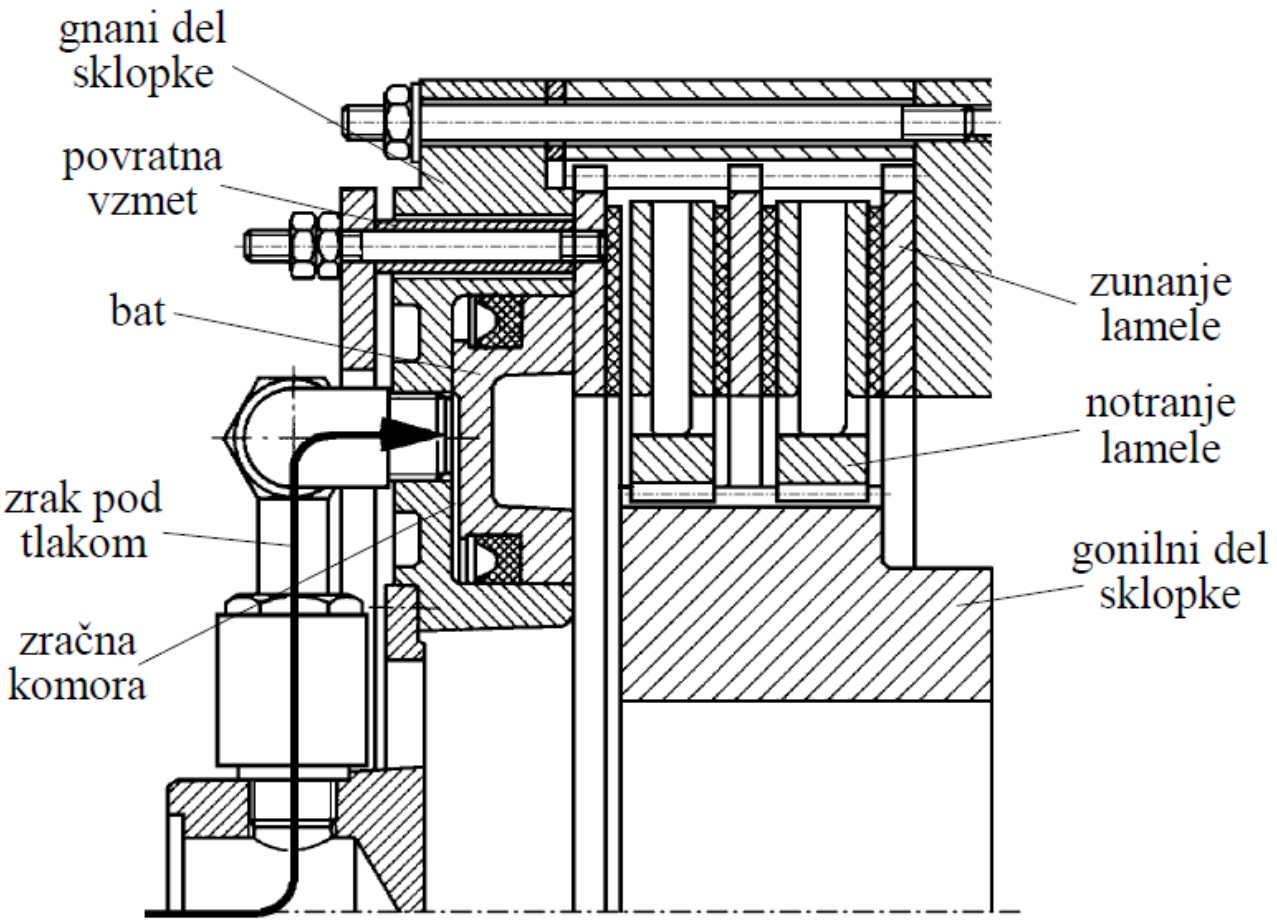
- enolamelna ploščata torna sklopka z elektromagnetnim vklapljanjem

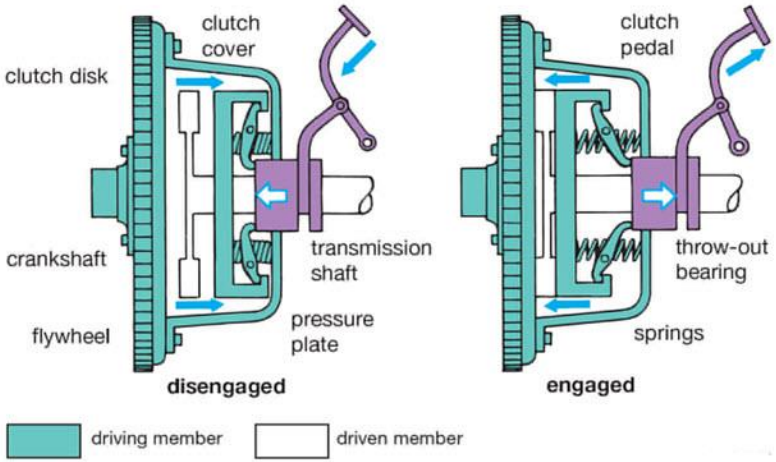


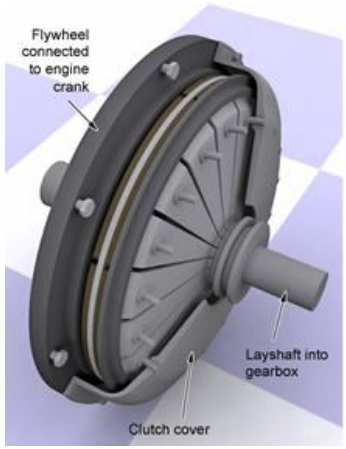
- večlamelna ploščata torna sklopka s hidravličnim vklapljanjem



- večlamelna ploščata torna sklopka s pnevmatskim vklapljanjem







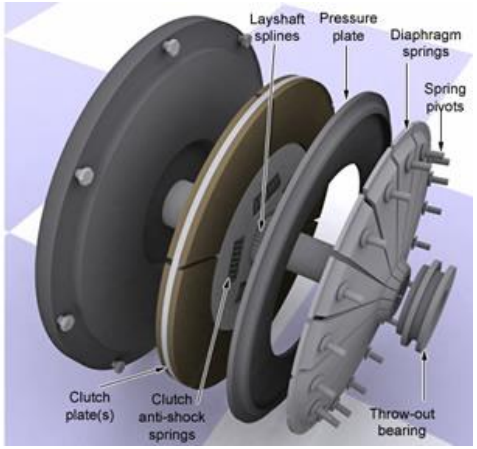
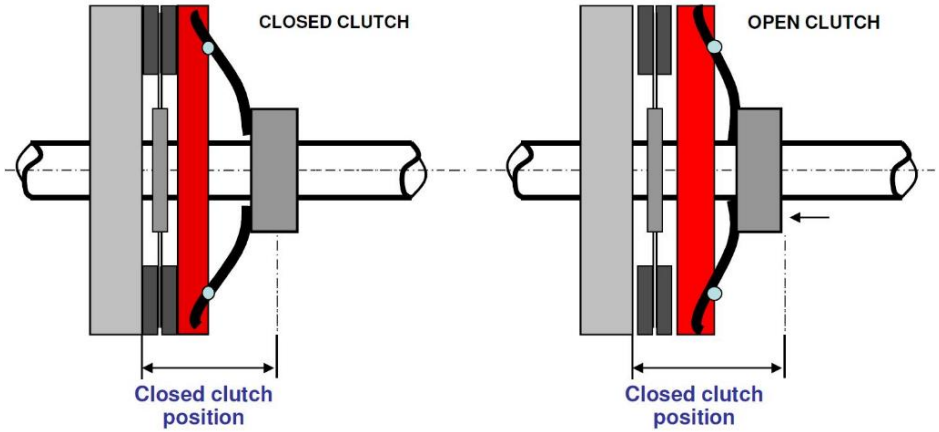


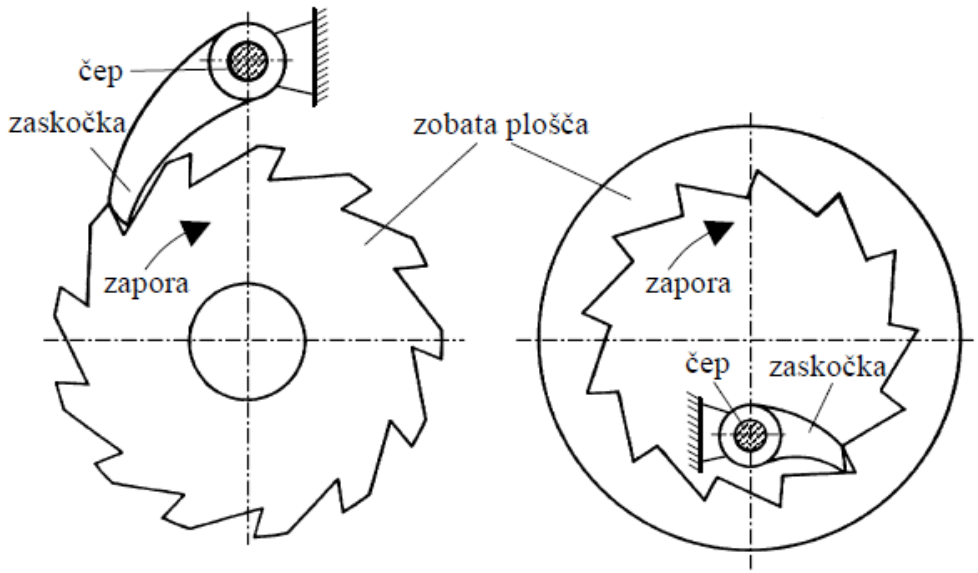
Fig. 10.2: Principle of friction clutch

(Source: http://media.web.britannica.com/eb-media/41/104141-004-5B075D35.gif)

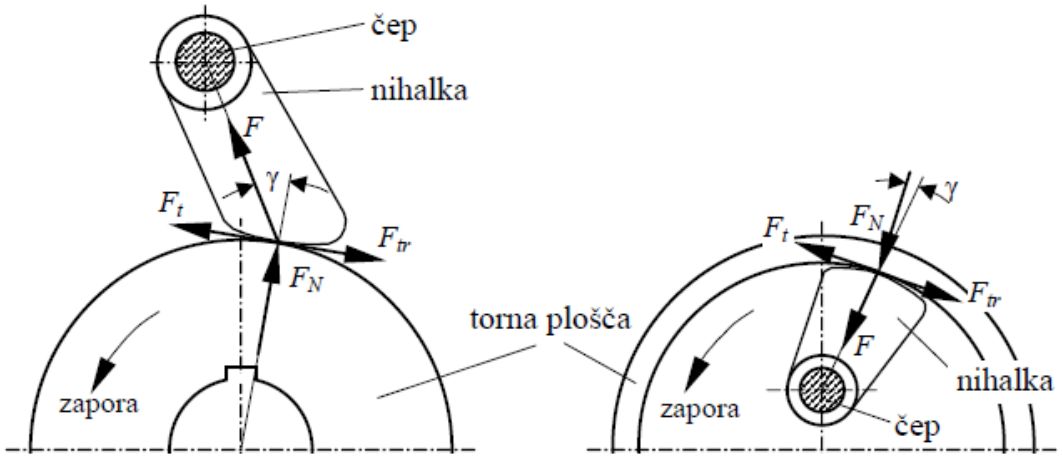


SKLOPKE ZA PROSTI TEK

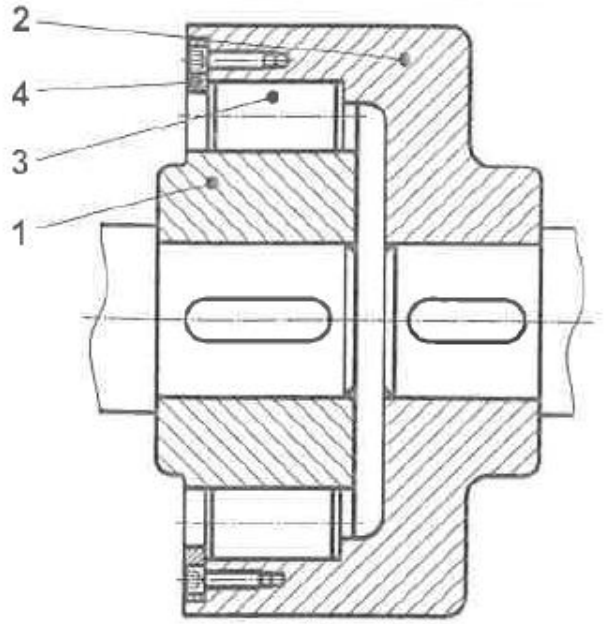
- zobate zapore

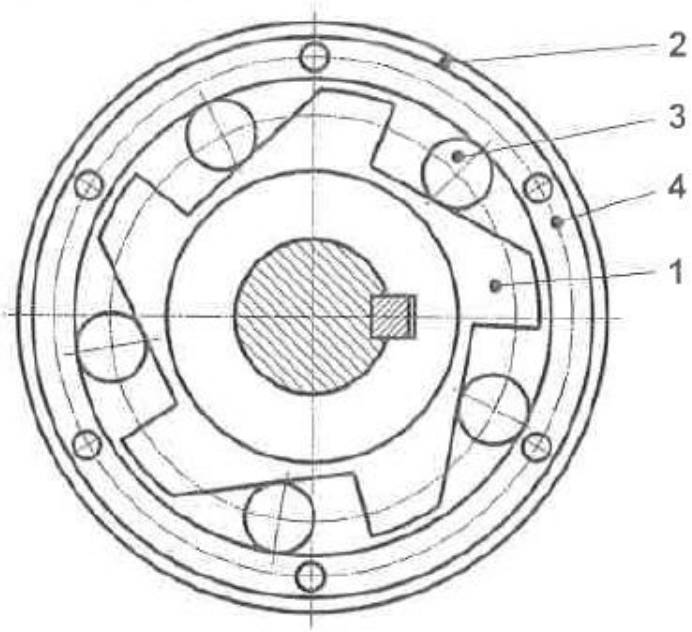


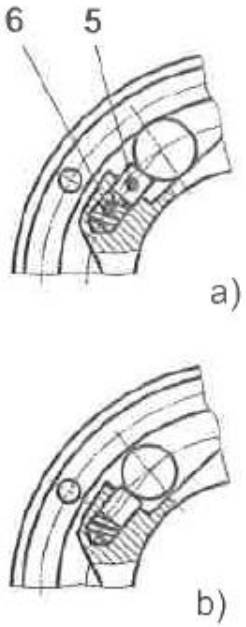
- torne zapore



ENOSMERNA SKLOPKA

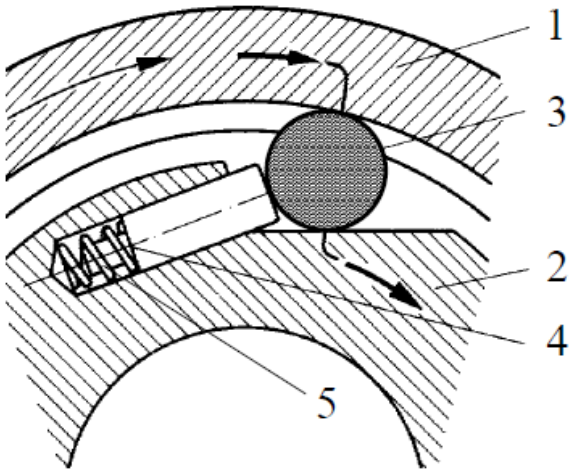




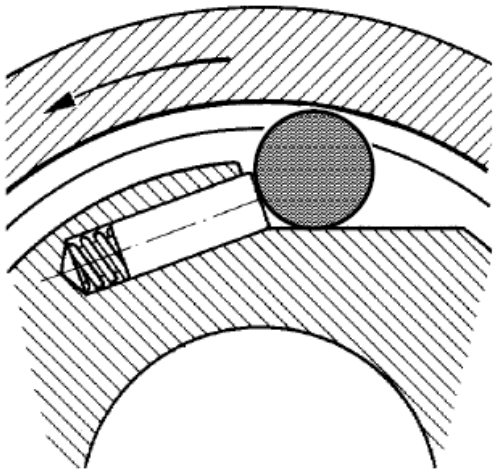


1 – gonilni obroč
2 – gnani obroč
3 – valjček
4 – varovalni obroč
5 – sornik
6 – vzmet

- enosmerna sklopka z zagozdnimi valjčki



prenos vrtilnega momenta



prosti tek

1 - zunanji obroč

2 - notranji obroč

3 - valjček

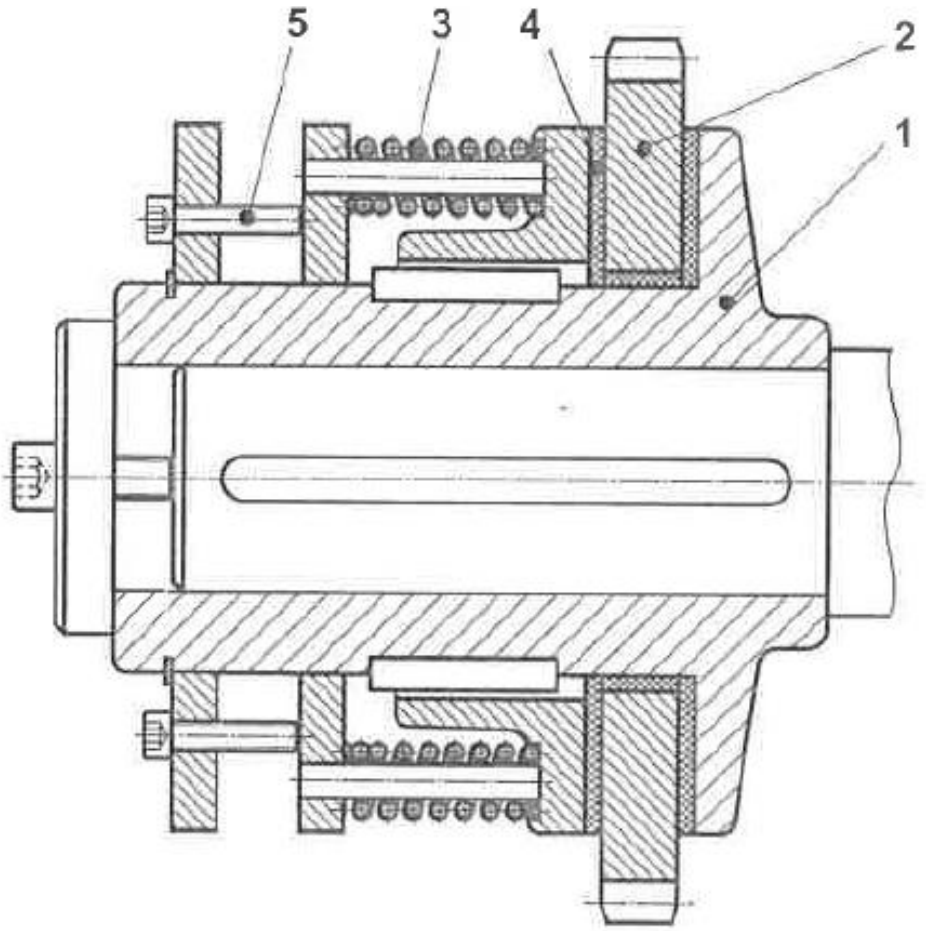
4 - sorniki

5 - vzmet

MOMENTNE SKLOPKE

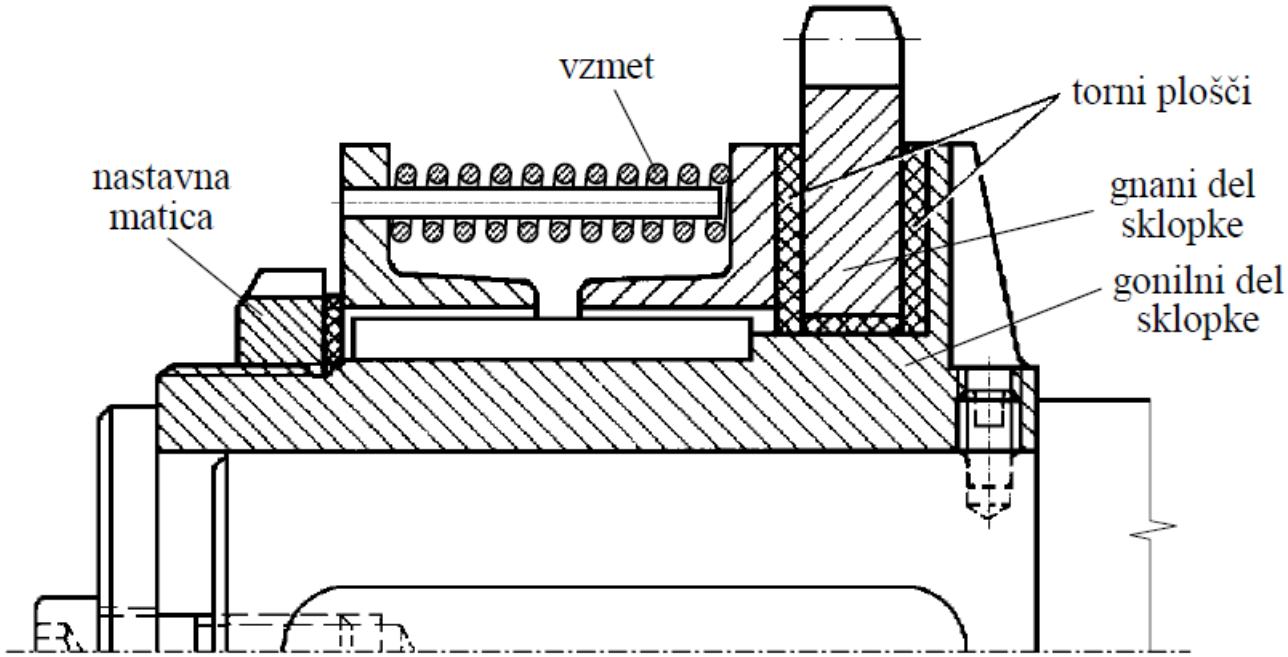
Samodejno se vklopijo ali izklopijo v odvisnosti od velikosti vrtilnega momenta.

LAMELNA VARNOSTNA SKLOPKA Z VZMETMI

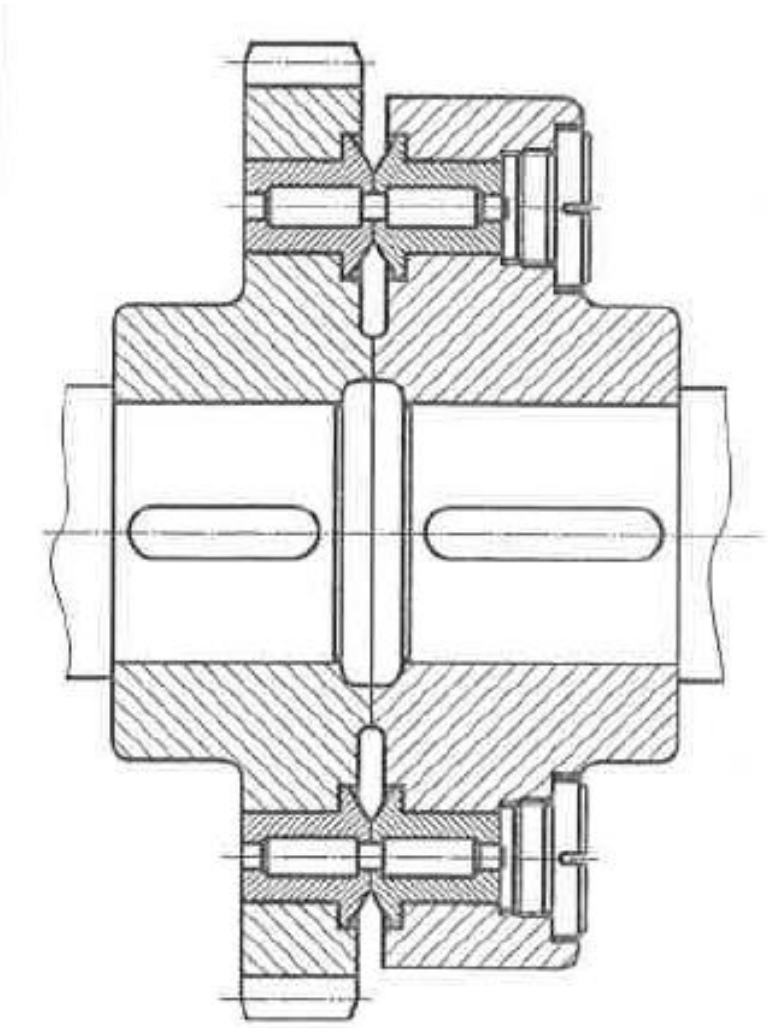


1 – gonilni del sklopke
2 – gnani del sklopke
3 – vzmet
4 – torna plošča
5 – privijalni vijak

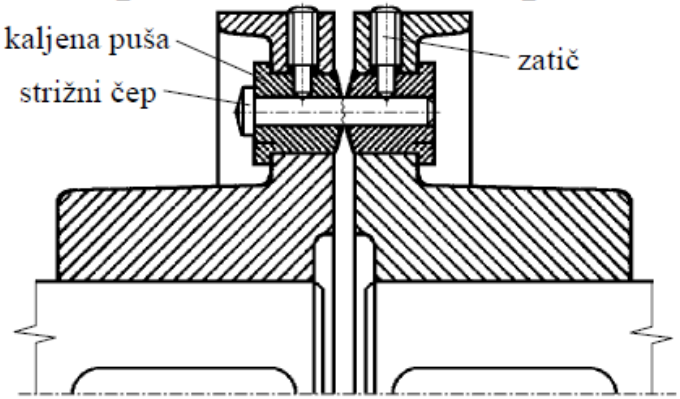
- torna varnostna sklopka



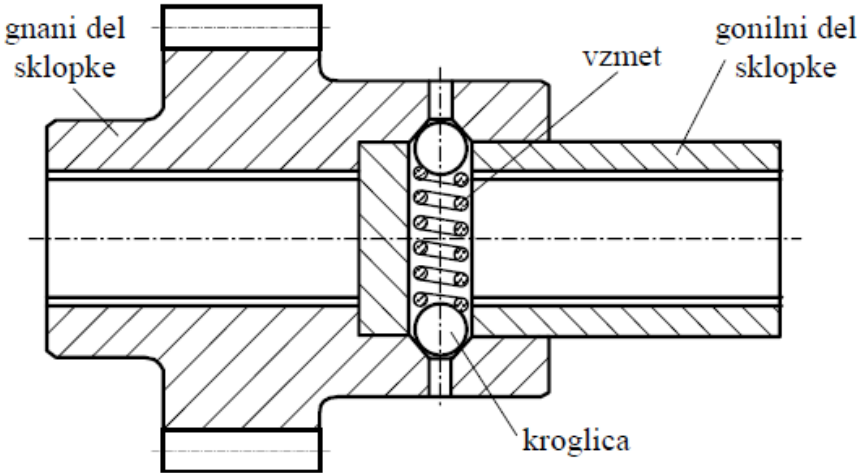
VARNOSTNA SKLOPKA S STRIŽNIMI ČEPI



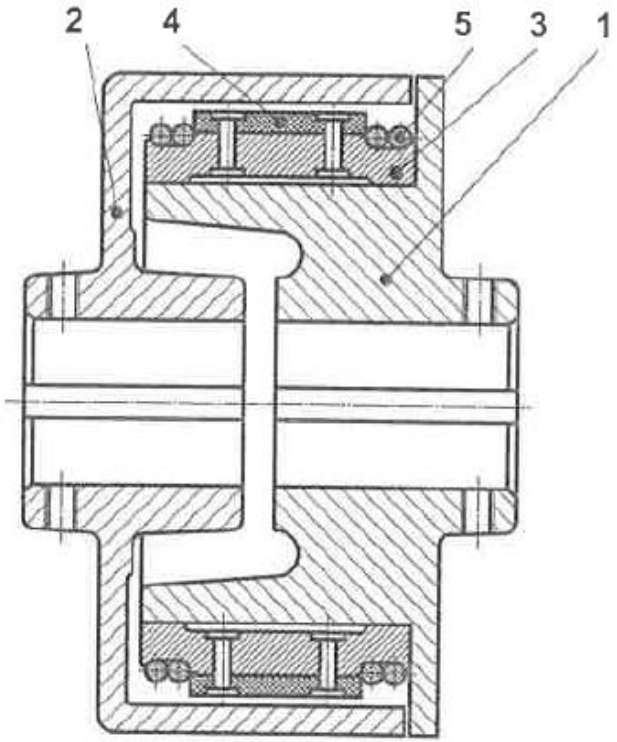
- oblikovna varnostna sklopka s strižnimi čepi

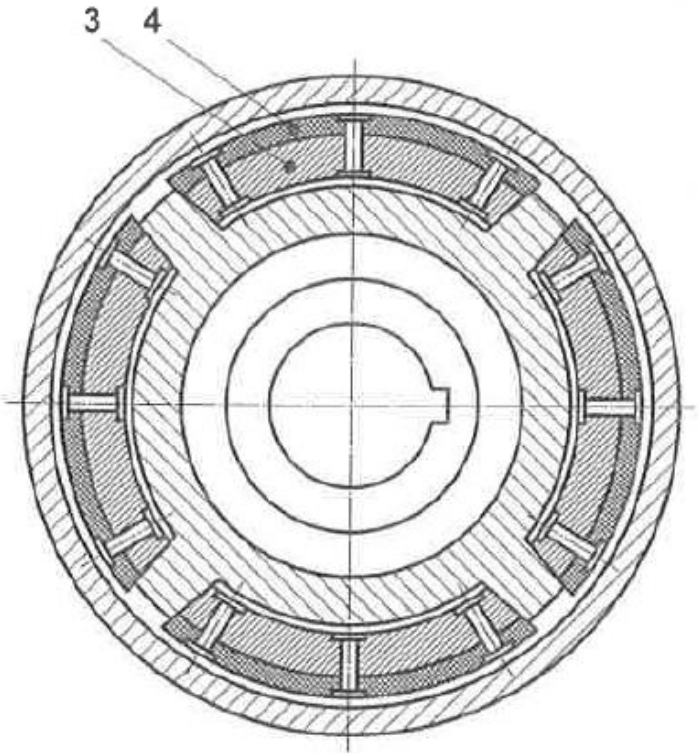


- oblikovna varnostna sklopka z vstavljenimi kroglicami



ČELJUSTNA ZAGONSKA SKLOPKA





1 – gonilni del sklopke
2 – gnani del sklopke
3 – čeljust
4 – torna obloga
5 – vzmetni obroč