



BRODSKI ENERGETSKI SUSTAVI

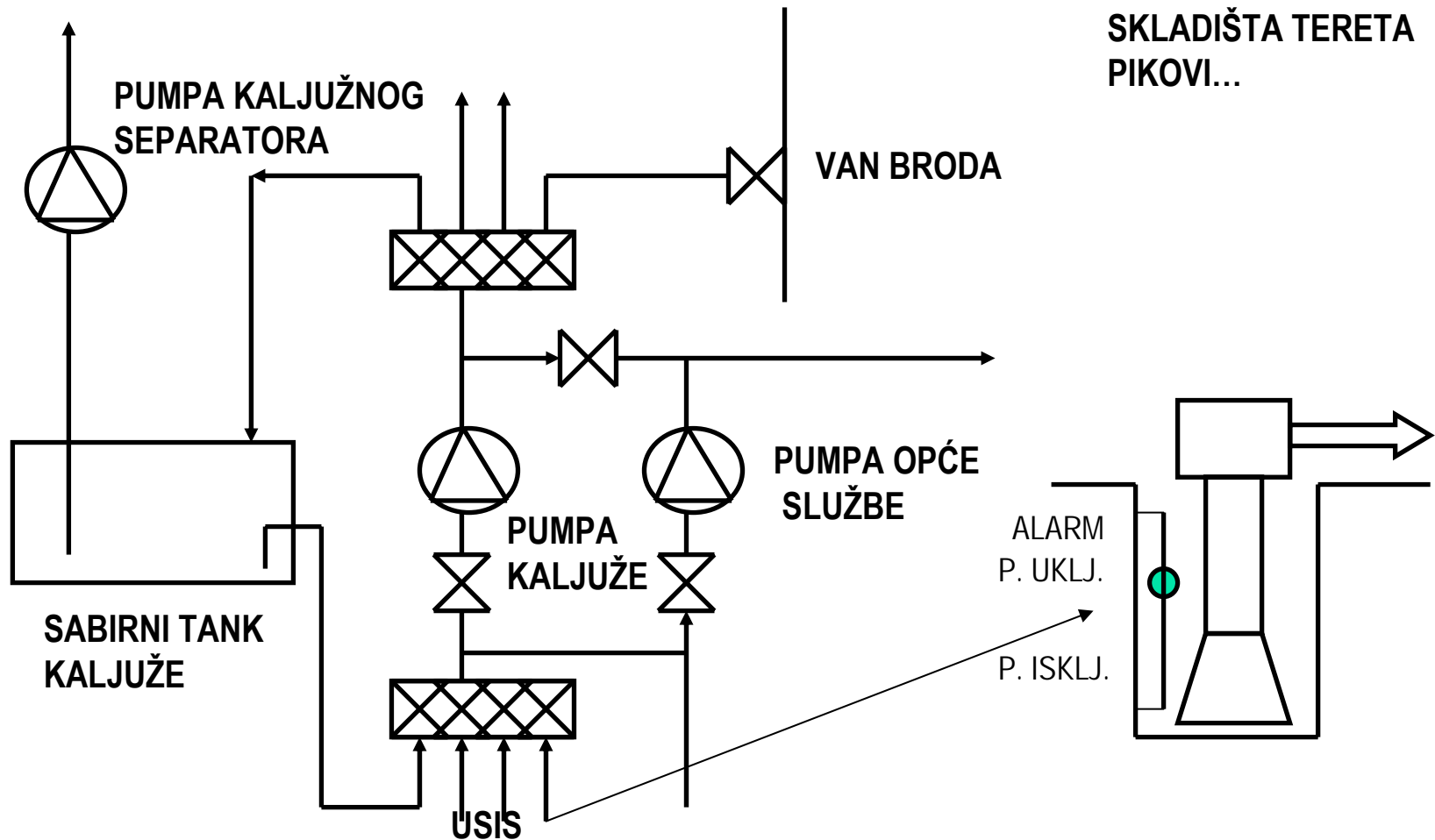
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Brodski strojni sustavi: pogonski  
(dizelmotorni poriv)

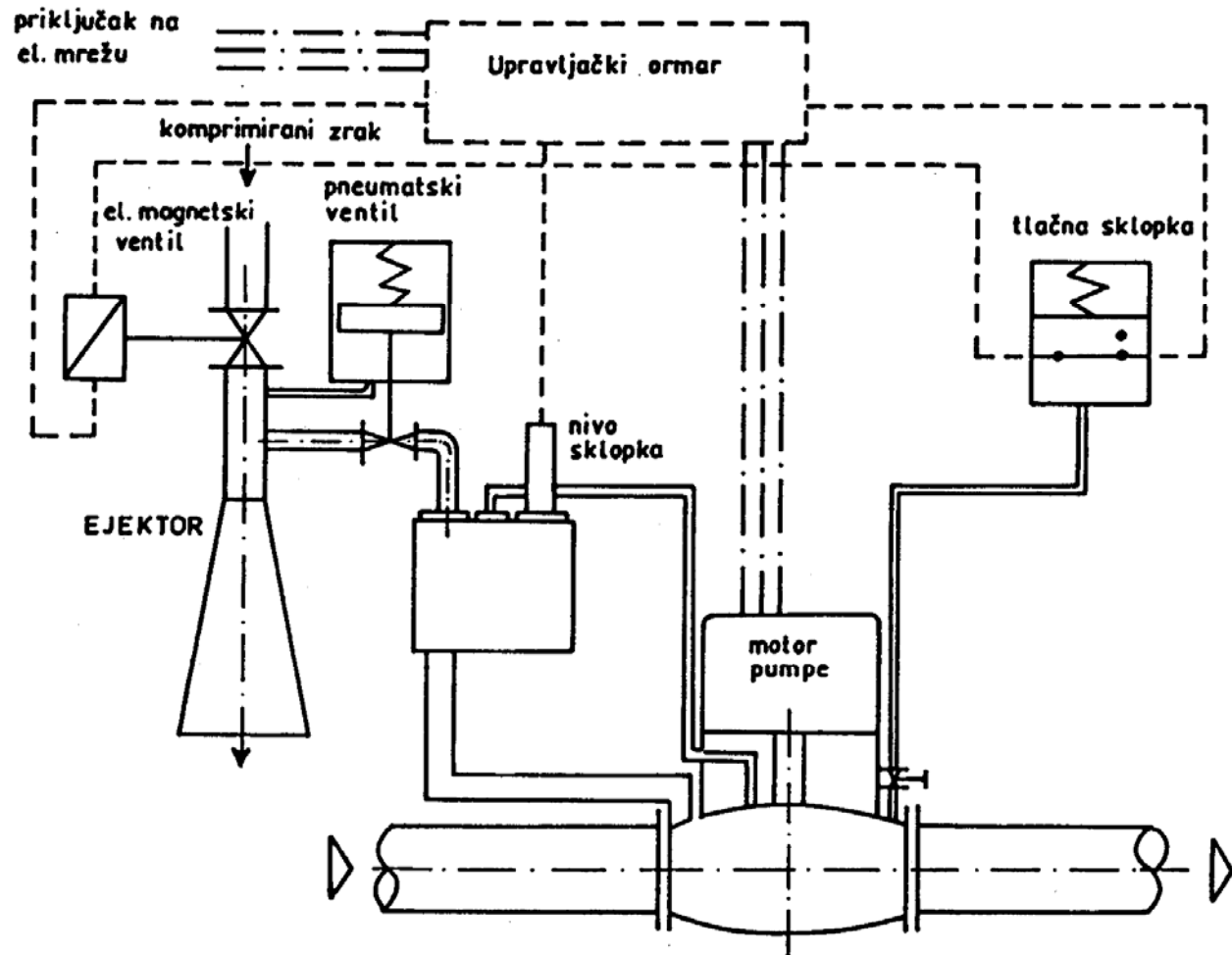
# Shema sustava kaljuže

USIS:

STROJARNICA  
TUNELSKA KOB.  
SKLADIŠTA TERETA  
PIKOVI...

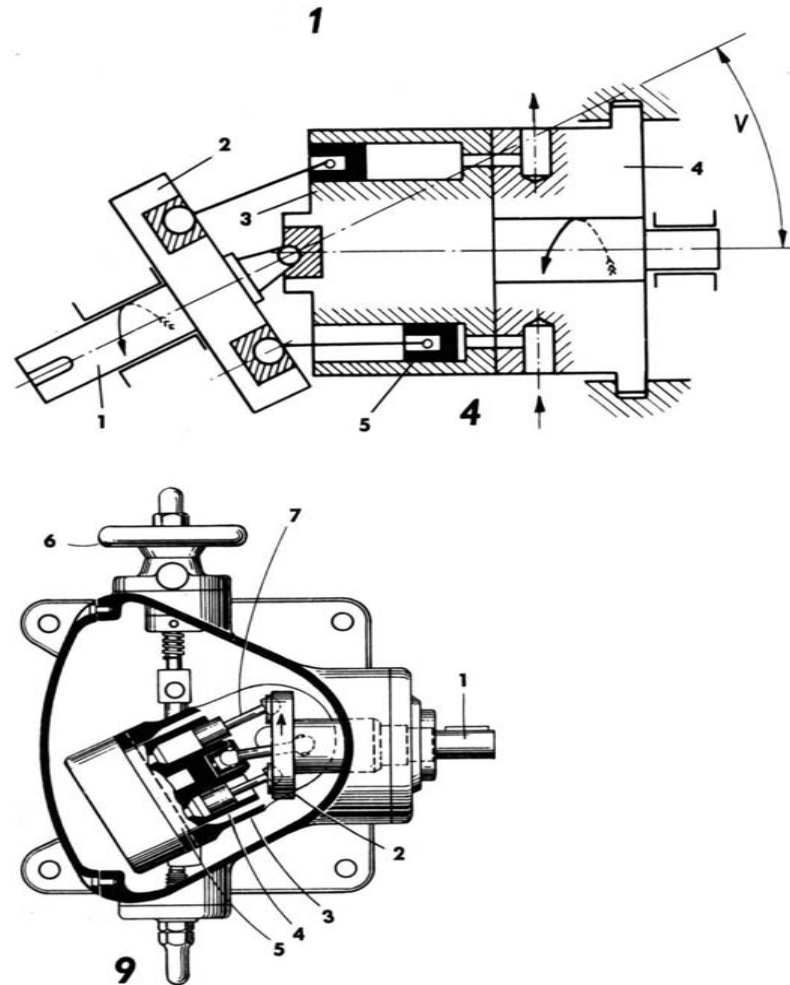
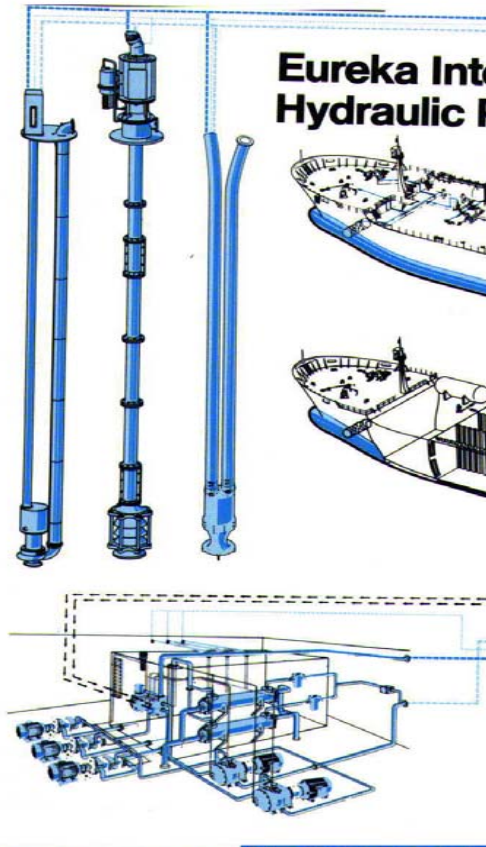


# Samosisna centrifugalna pumpa

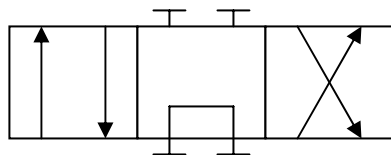


# Hidraulika

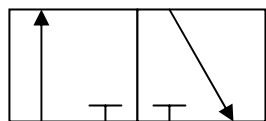
VELIKI TLAKOVI  
PUMPE TERETA, PALUBNI UREĐAJI,  
DALJINSKO OTVARANJE VENTILA



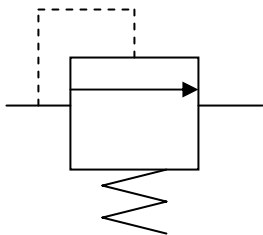
# Simboli



4/3



3/2





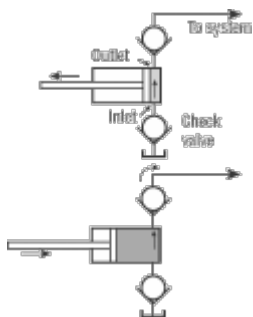
# Radni fluidi

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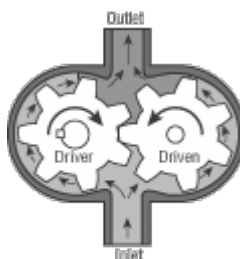
- svojstva: stabilnost kod povišenih temperatura, kemijska stabilnost, nekorozivnost, konstantan viskozitet, niska cijena, ekološki prihvatljivi, otporni na zapaljenje...
- aditivi
- osnove: biljna ulja, umjetni esteri ili mješavina

# Elementi hidrauličkih sustava

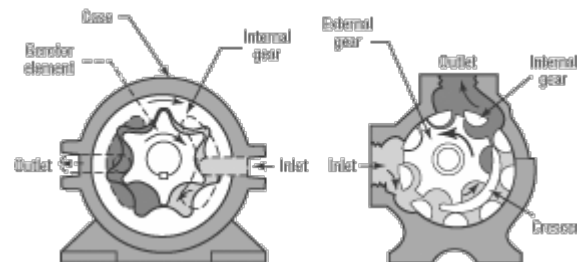
~~PUMPE: STAPNE – KLIPNE, ZUPČASTE, VIJČANE, LAMELASTE...~~



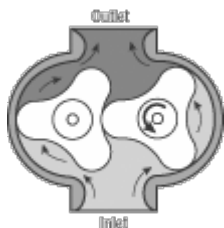
STAPNA – KLIPNA



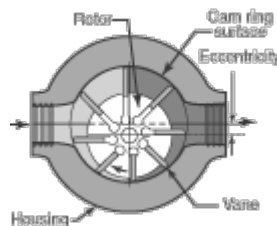
ZUPČASTA



S UNUTARNJIM  
OZUBLJENJEM



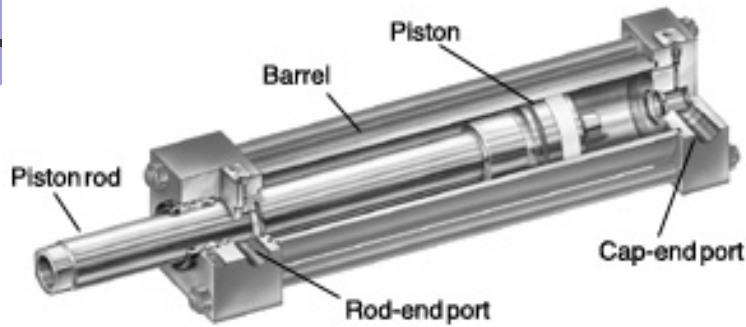
REŽNJASTA



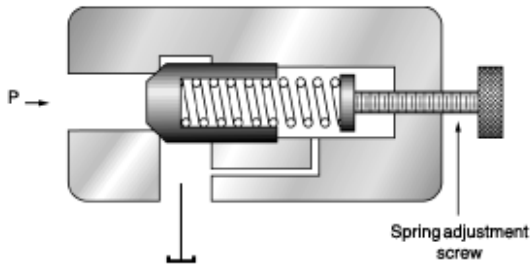
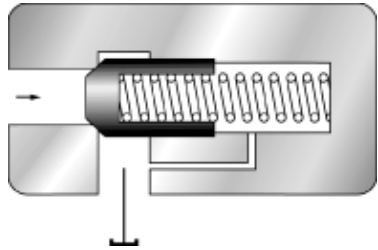
LAMELASTA

MOTORI

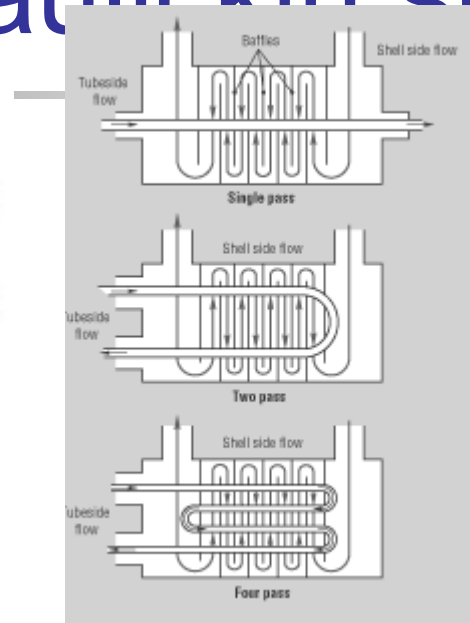
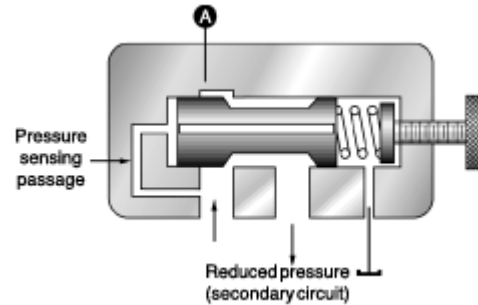
# Elementi hidrauličkih sustava



**CILINDAR - AKTUATOR**

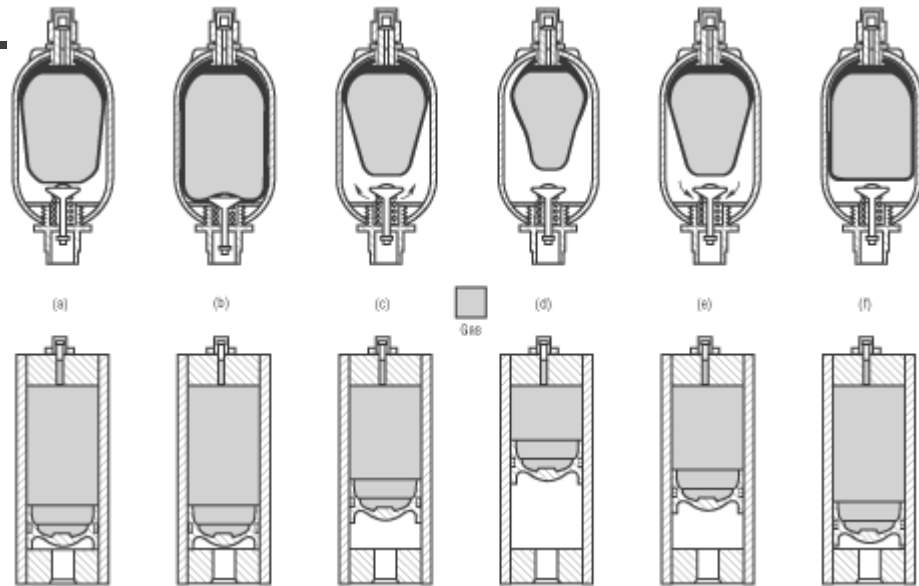


**VENTILI KONSTANTNOG TLAKA**



**RASHLADNICI**

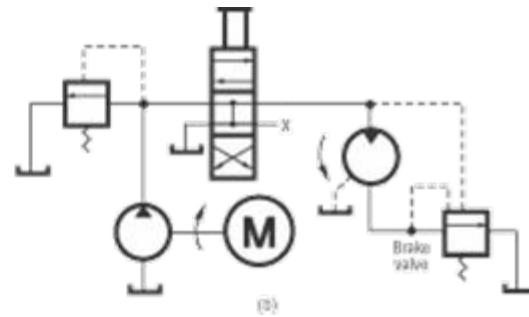
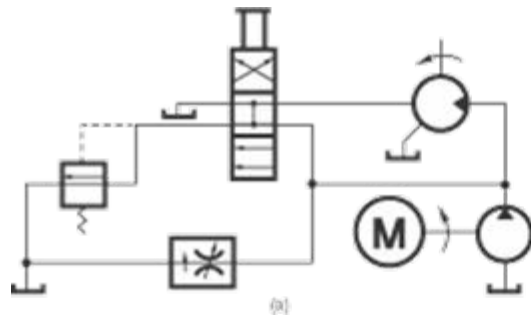
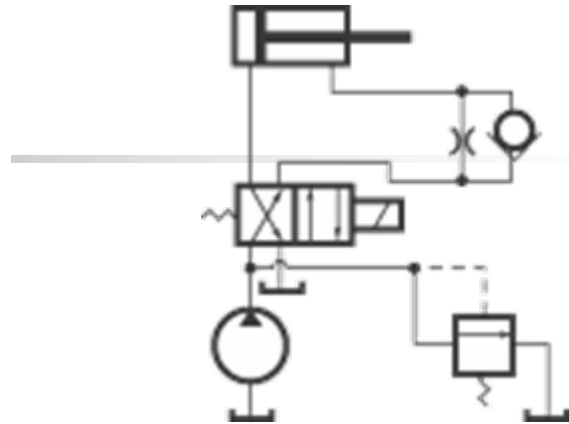
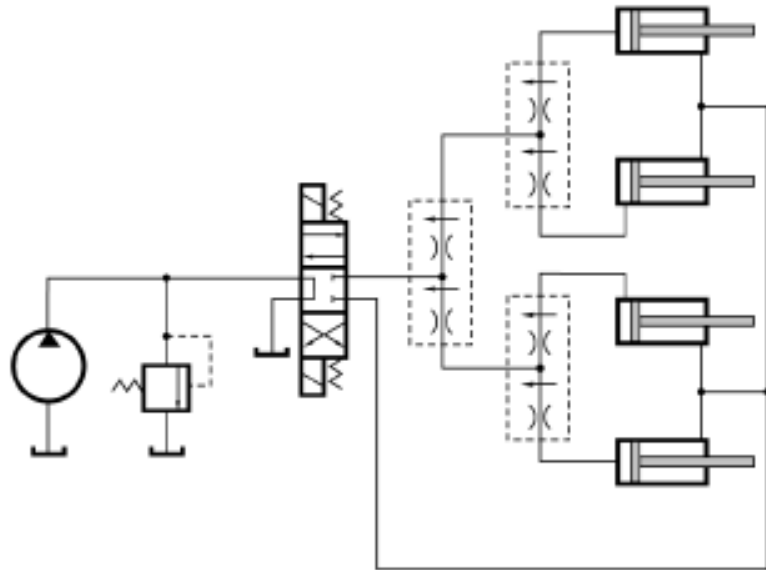
# Elementi hidrauličkih sustava



**AKUMULATOR S MIJEHOM**

**AKUMULATOR S KLIPOM**

# Scheme





# Balast - svrha

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- Stabilitet
- Trim (rad propelera i kormila)
- Naprezanja i deformacije trupa
  - momenti savijanja, poprečne sile
  - glavni porivni stroj
- Bolja maritimna svojstva, a posebno pri lošim vremenskim uvjetima



# Balast

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- 1 balastna pumpa, kaljužna, opće službe, (pp, rezervna rashladne vode)\*

$$Q \Rightarrow v_{usis} \geq 2m / s$$

$$d_u = 18\sqrt[3]{V}$$

\*ne ako se tankovi sustavno koriste za gorivo

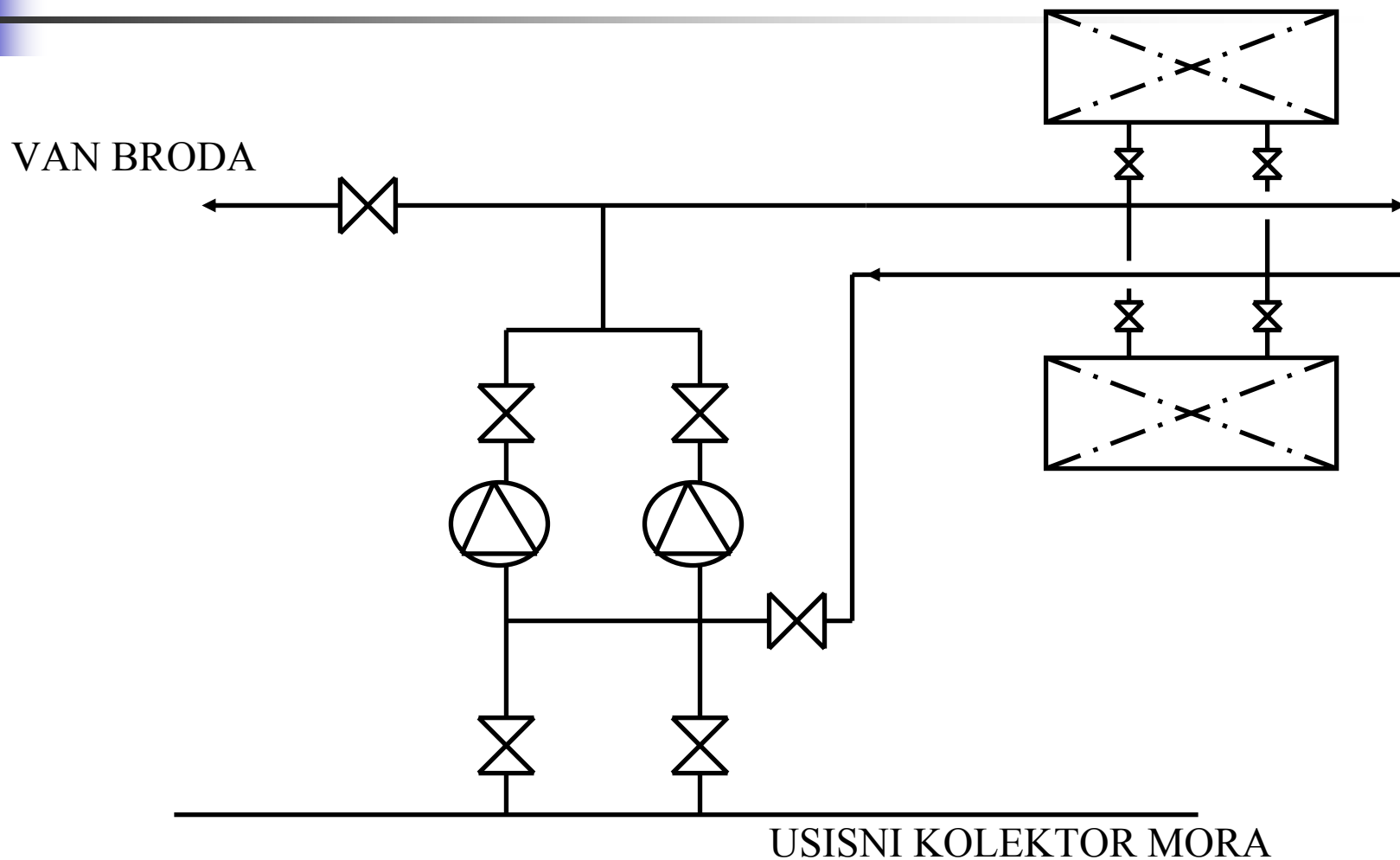


# Balast – tankeri za ulje

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- “odvojeni” i “čisti” balast
- dvodno, pramčani (i krmeni) pik, bočni tankovi, visoki tankovi
- TT – balast u nuždi, t. goriva
- veza sustava tereta i balasta
- punjenje gravitacijom

# Shema sustava



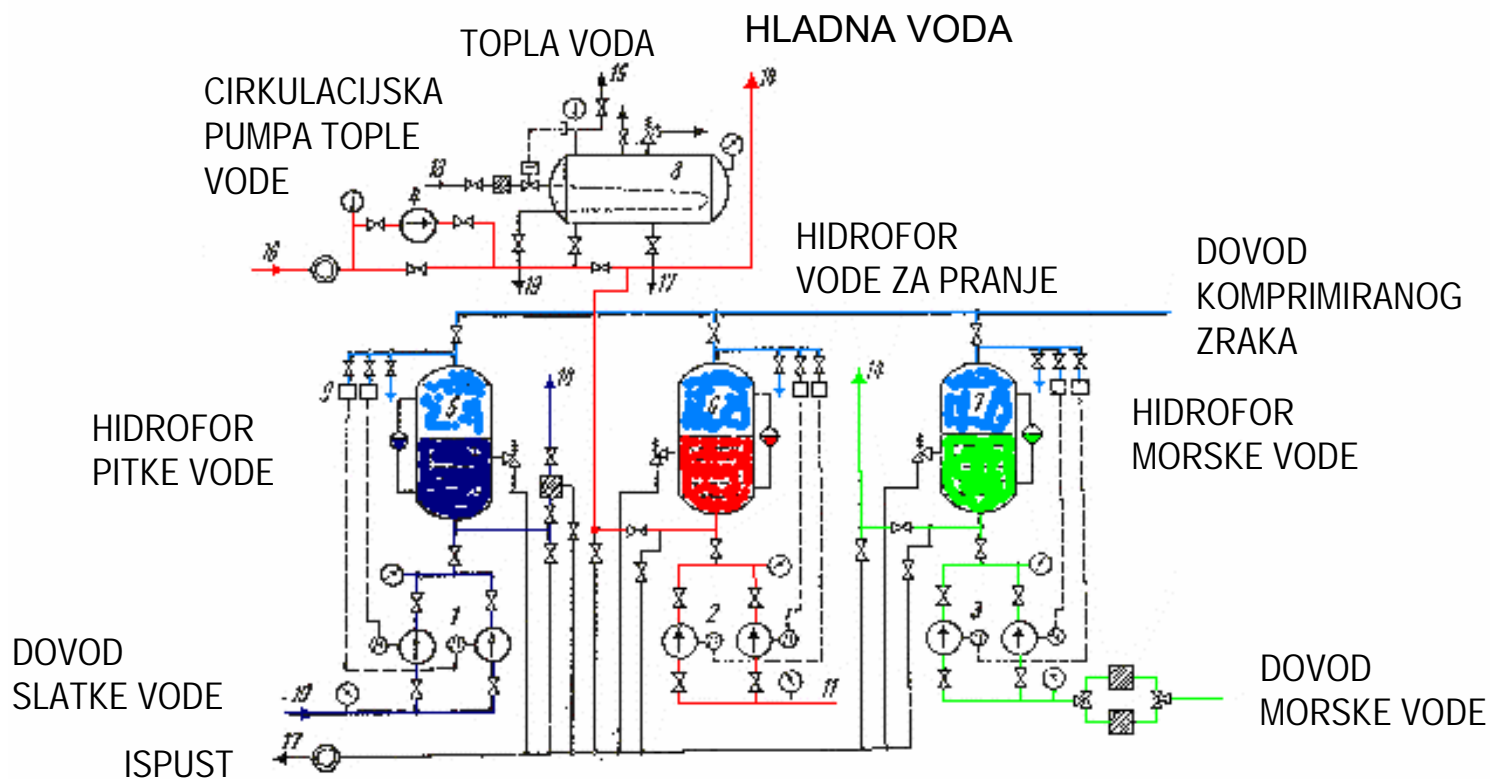


# Balast – RO-RO

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- “antiheeling”
- inklinometar
- dva tanka na nasuprotnim stranama, aksijalna pumpa, ventil

S

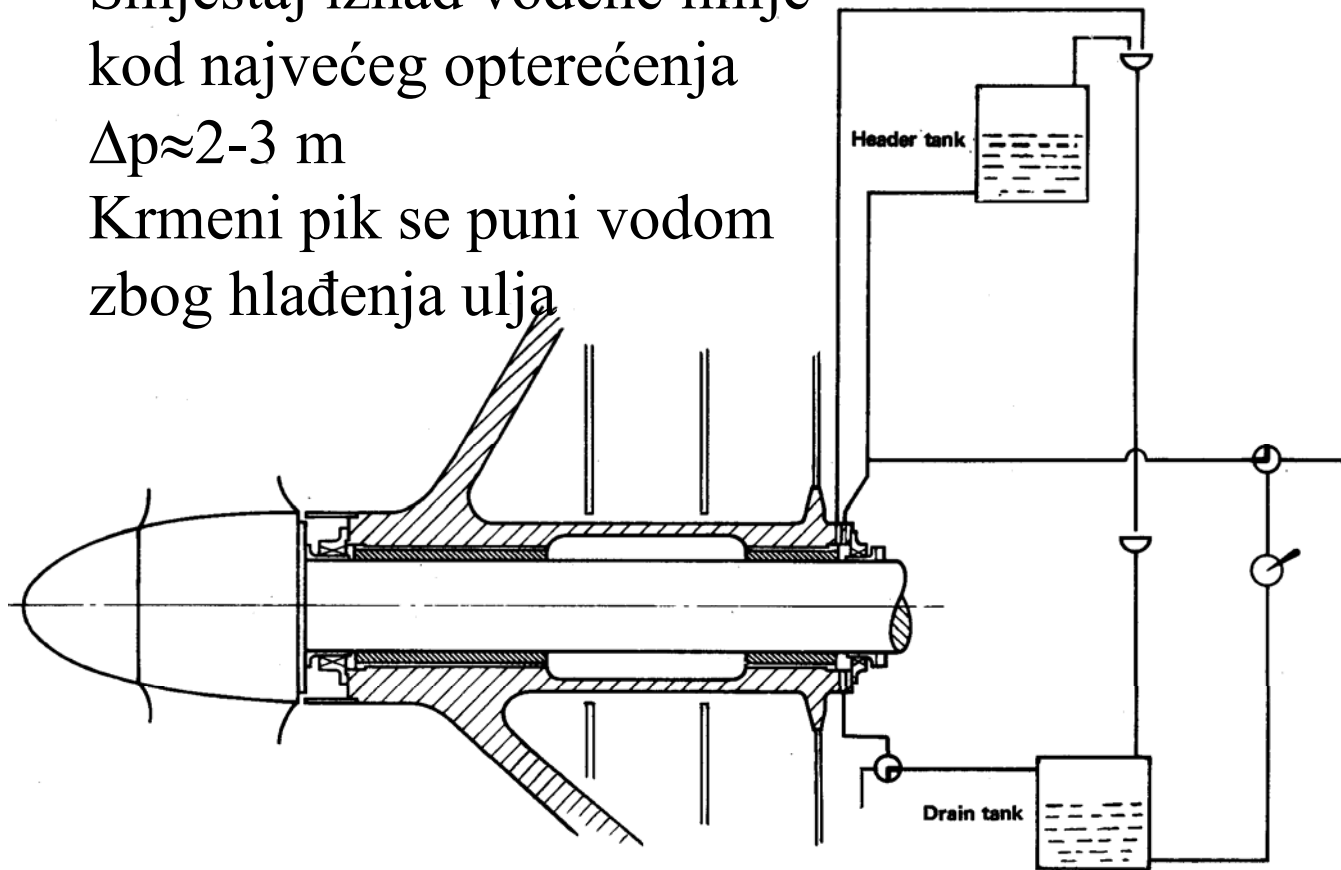


# Ulje stativne cijevi

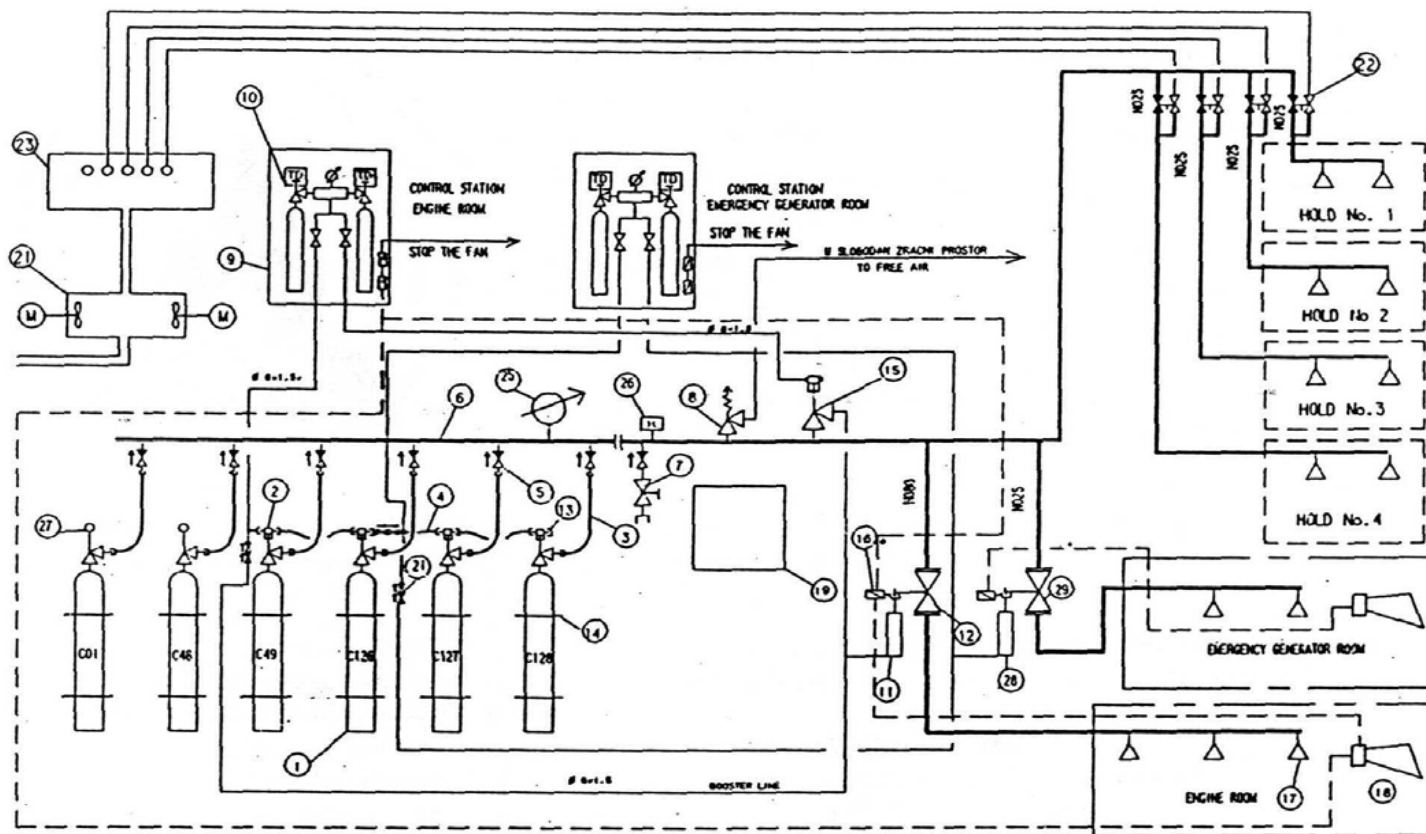
Smještaj iznad vodene linije  
kod najvećeg opterećenja

$\Delta p \approx 2-3 \text{ m}$

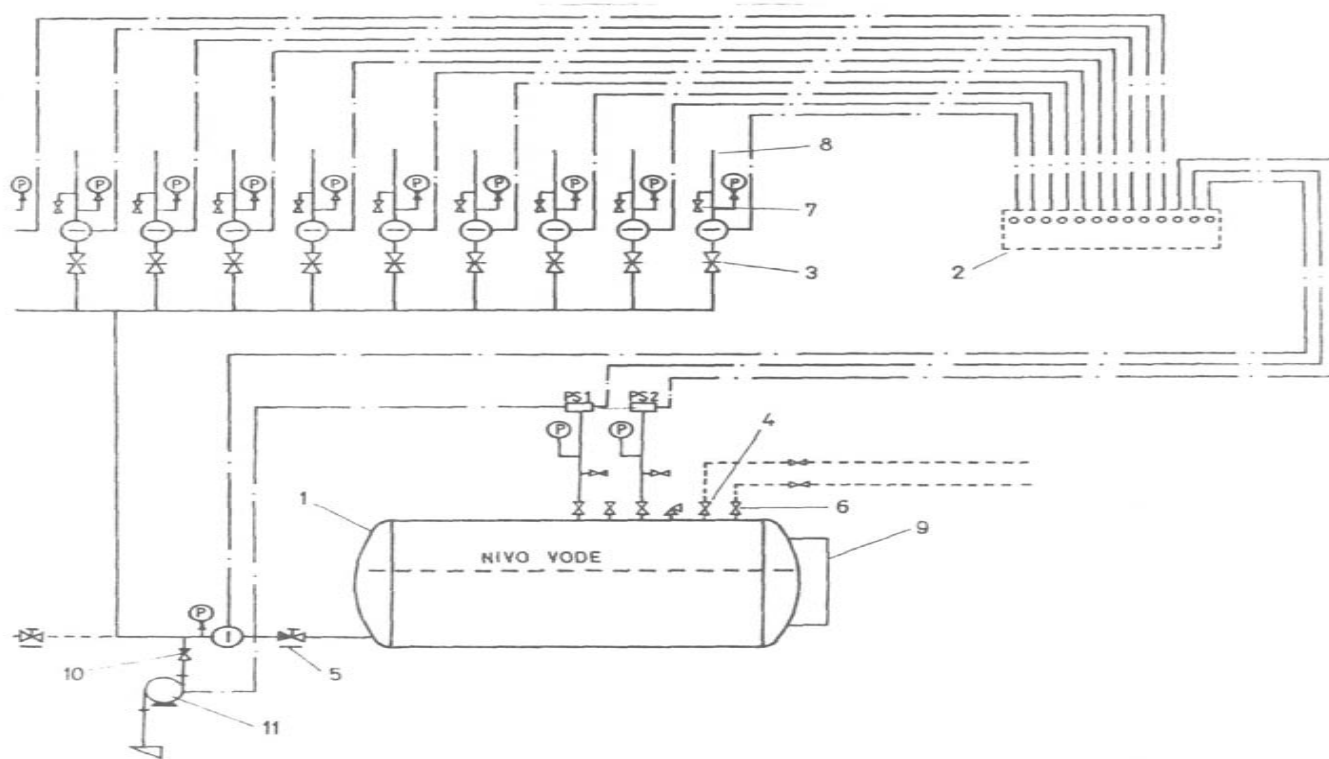
Krmeni pik se puni vodom  
zbog hlađenja ulja



# Sustav gašenja požara s CO2



# Sprinkler protupožarni sustav



Automatski sustav za gašenje požara  
prskanjem (Sprinkler-uredjaj)