



“TOSHKENT IRRIGATSIYA VA QISHLOQ  
XO‘JALIGINI MEXANIZATSIYALASH  
MUHANDISLARI INSTITUTI” MILLIY TADQIQOT  
UNIVERSITETI



Mavzu

•Dvigatellarning ta‘minlash  
tizimi



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PhD. Traktorlar va avtomobillar  
kafedrasi dosenti



# Dvigatellarning ta'minlash tizimi

- ❑ **Toshkent irrigatsiya va qishloq xo'jaligini mexanizatsiyalash muxandislari instituti MTU**
- ❑ **Qishloq xo'jaligini mexanizatsiyalash fakulteti**
- ❑ **Traktorlar va avtomobillar kafedrası**



# Dvigatellarning krivoship shatun va gaz taqsimlash mexanizmlari

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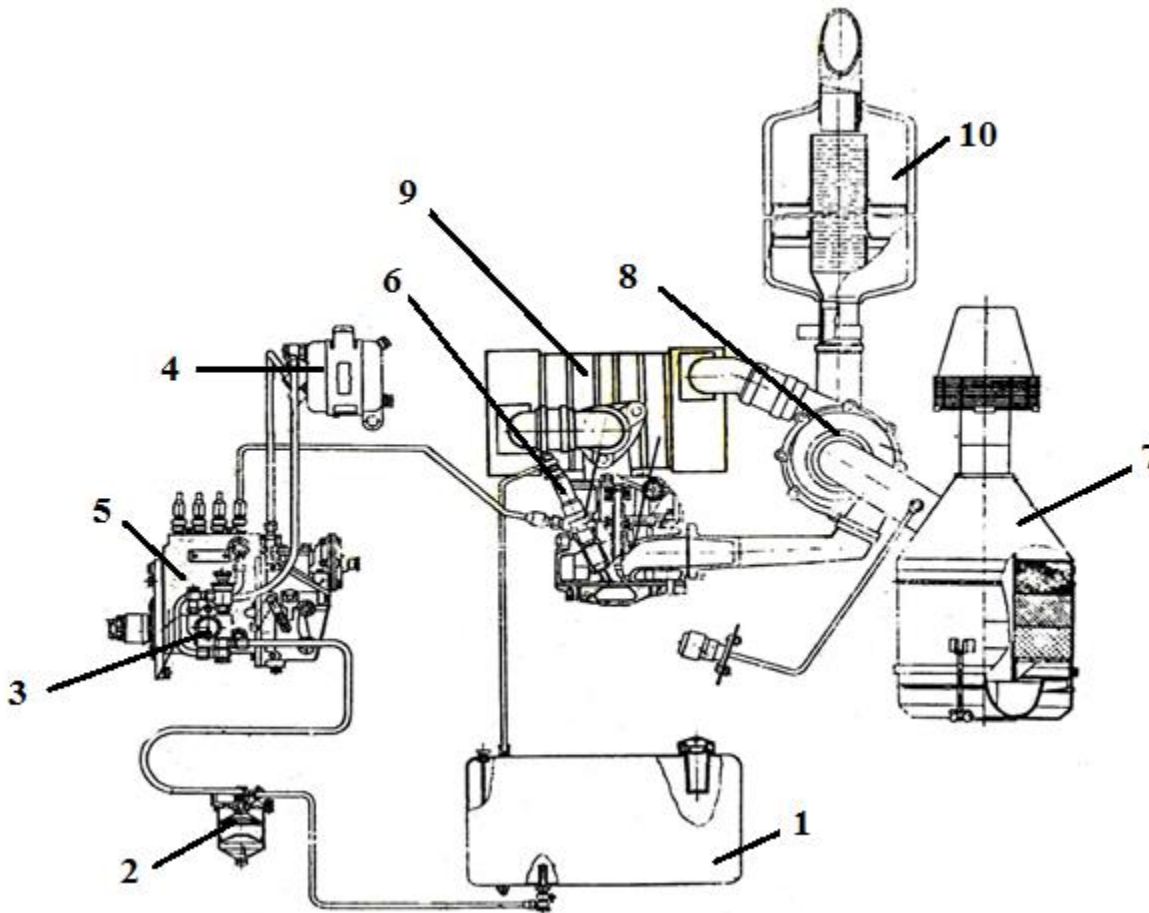
## Reja

- Dvigatellarning ta'minlash tizimi
  - Dizelning an'anaviy ta'minlash tizimi
  - Karbyuratorli dvigatellarning ta'minlash tizimi
  - Benzinda ishlaydigan injektorli va dizellarda foydalanilgan Common Rail injektorli yonilg'i bilan ta'minlash tizimi
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# Dvigatellarning ta'minlash tizimi

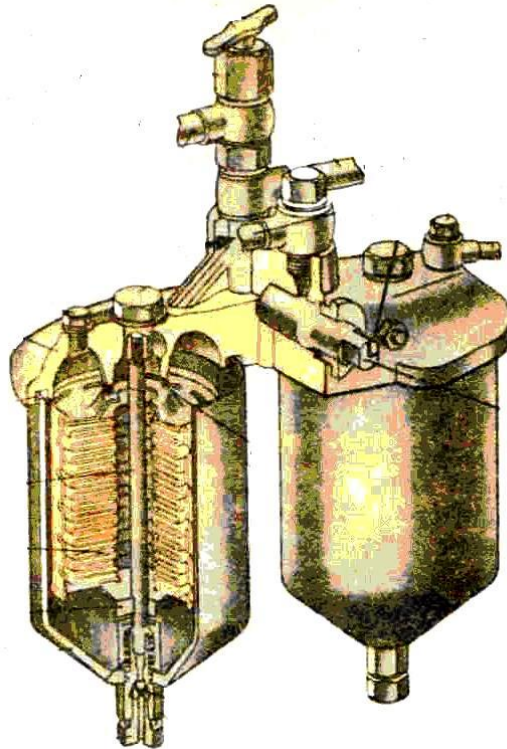
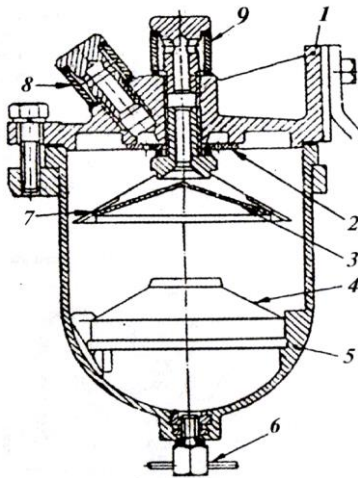
- **Ta'minlash tizimi vazifasi**
  - Dvigatel silindrlariga havo va yonilg'ini tozalab alohida-alohida yoki aralashma shaklida kerakli miqdorda yetkazib berish uchun xizmat qiladi
- **Dvigatelda ishlatilayotgan yonilg'i turiga qarab ta'minlash tizimi tuzilishi va ishlashi turlicha**
  - **Dizel yonilg'isida ishlaydigan dvigatellar**
    - an'anaviy ta'minlash tizimi
    - injektorli ta'minlash tizimi
  - **Benzinda ishlaydigan dvigatellar**
    - karbyuratorli ta'minlash tizimi
    - injektorli ta'minlash tizimi
  - **Gazda ishlaydigan dvigatellar**
    - suyultirilgan gazda ishlaydigan dvigatellar ta'minlash tizimi
    - siqilgan gazda ishlaydigan dvigatellar ta'minlash tizimi

# Dizelning an'anaviy ta'minlash tizimi



- 1-Yonilg'i baki**
- 2-Dag'al yonilg'i tozalash filtri**
- 3-PBYoN**
- 4-Mayin yonilg'i tozalash filtri**
- 5-YUBYoN**
- 6-Forsunka**
- 7-Havotozalagich**
- 8-Turbokompressor**
- 9-Havoni oraliq sovitgich**
- 10-Glushitel**

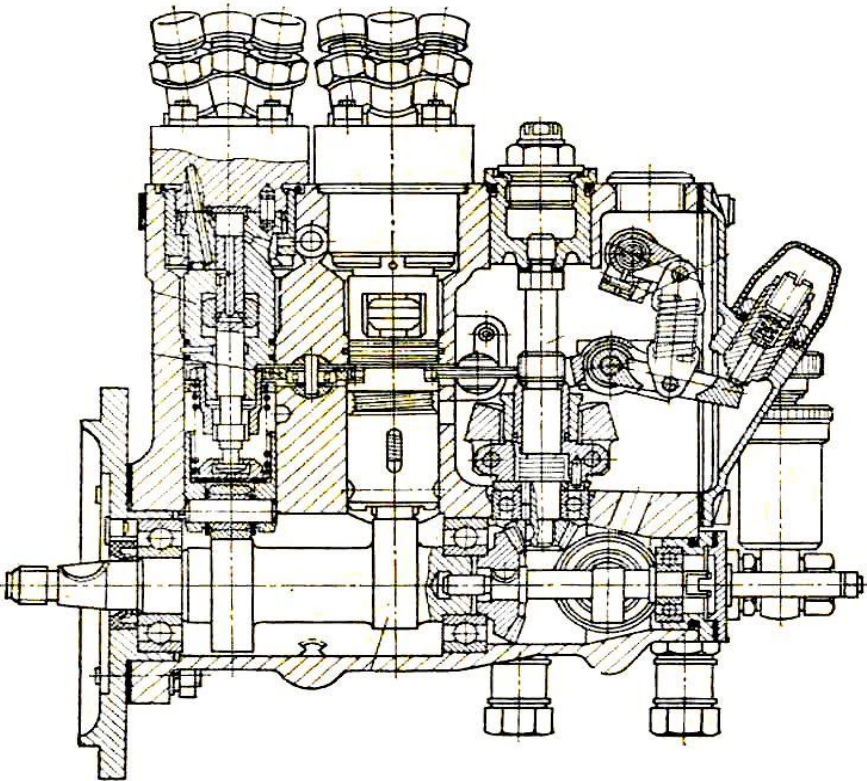
# Dizelning an'anaviy ta'minlash tizimi



- Yonilg'i tozalash filtrlari
- Dag'al filtr
  - yonilg'ini yirik mexanik zarrachalar va suvdan tozalaydi (tindirish usulidan va setkadan foydalaniladi)
  - zarrachalar o'lchami 50 ... 100 mkm
- Mayin filtr
  - yonilg'ini mayda mexanik zarrachalardan tozalaydi (filtrlash usulidan foydalaniladi)
  - zarrachalar o'lchami 2 ... 10 mkm
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# Dizelning an'anaviy ta'minlash tizimi



Taqsimlash tipidagi ND 22/6

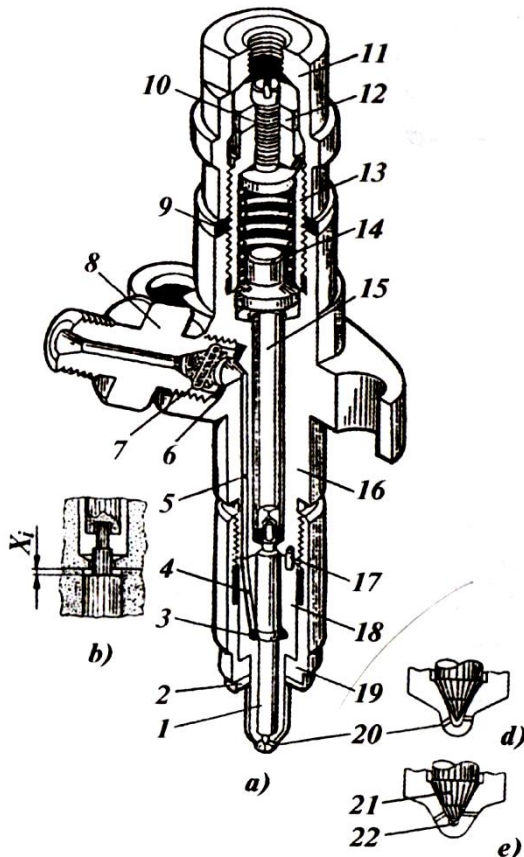
## □ YUBYON quyidagi vazifalarni bajaradi

- forsunkaga uzatilayotgan yonilg'ini bosimini oshirib beradi
- hamma silindrlarga bir xilda yonilg'i berilishini ta'minlaydi
- yonilg'ini silindrlarga o'z vaqtida etkazib beradi
- dvigatelga tushayotgan yuklanishga qarab silindrlarga uzatilayotgan yonilg'i miqdorini rostlaydi

## 2 xil turi mavjud

taqsimlash tipidagi (1 yoki 2 seksiyali)  
qatorli (seksiyalar soni silindrlar soniga teng)

# Dizelning an'anaviy ta'minlash tizimi

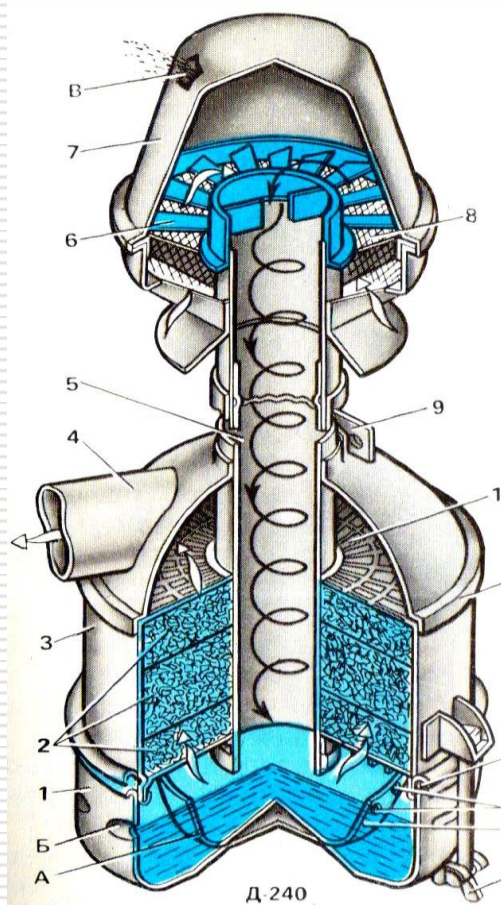


## Forsunka

- ❑ yonilg'ini mayda zarrachalar shaklida katta bosim bilan silindrga (yonish kamerasiga) purkaydi
- ❑ bir teshikli (shtiftli)
  - asosan ajratilgan yonish kamerali dizellarda ishlatiladi
- ❑ ko`p teshikli
  - yonish kamerasi ajratilmagan dizellarda ishlatiladi
- ❑ purkagichdagi teshiklar soni yonish kamerasi shakli va o'lchamlariga bog'liq



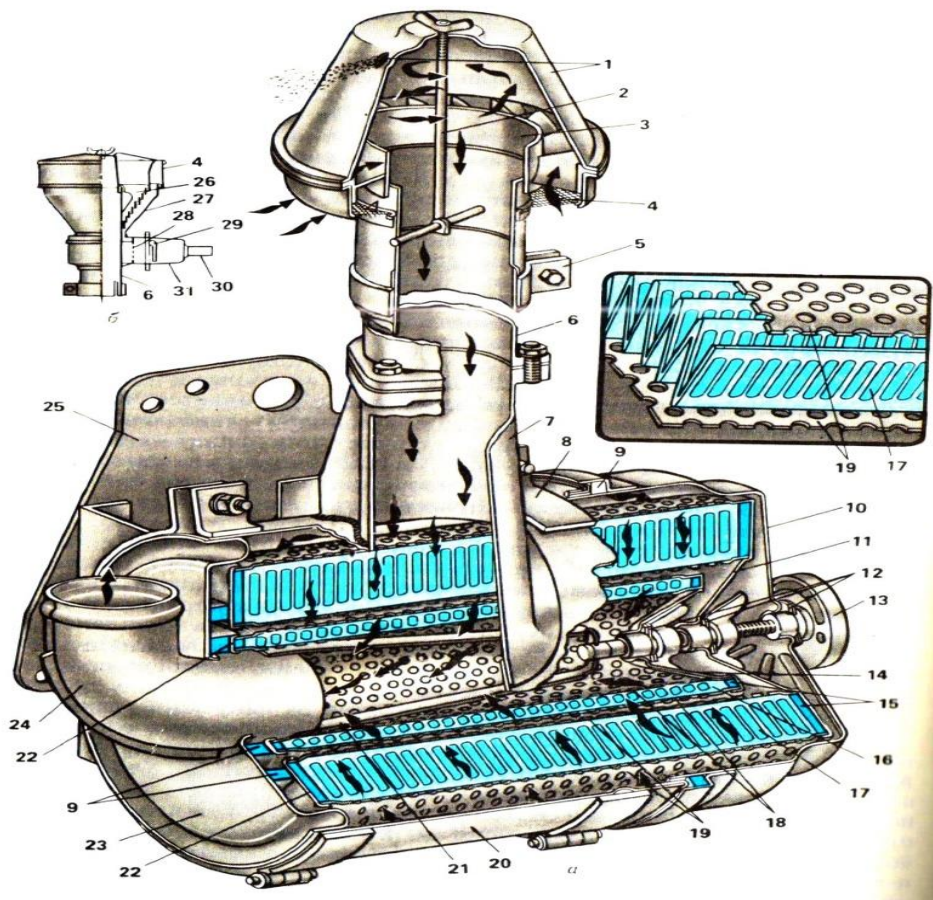
# Dvigatellarning ta'minlash tizimi



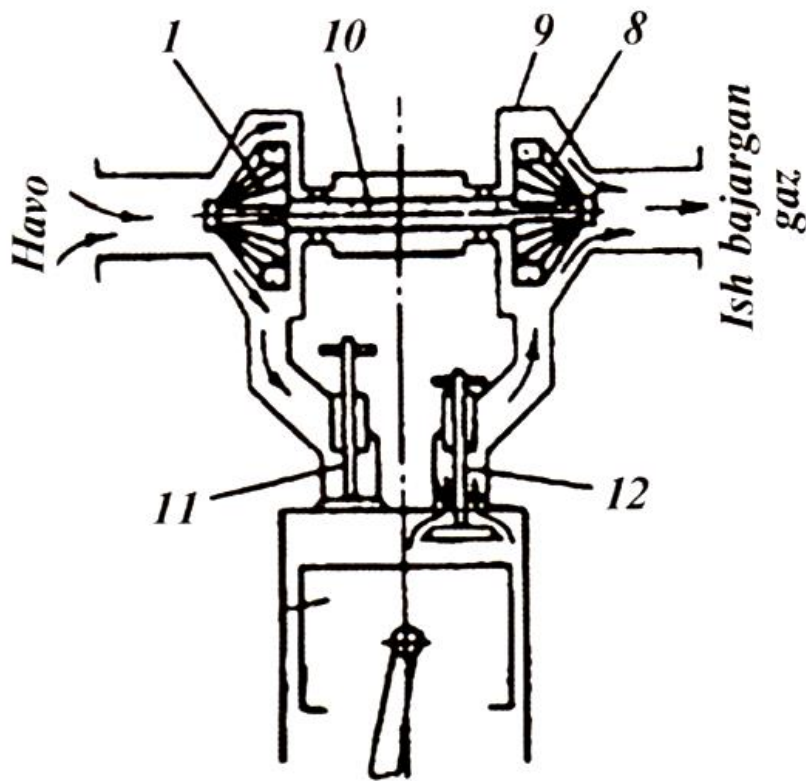
## Havotozalagichlar

- ❑ Dvigatel silindrlariga kiritilayotgan havoni chang zarrachalaridan tozalash uchun ishlatiladi
- ❑ Moy vannali yoki quruq tipda bo'lishi mumkin
- ❑ Havoni tozalashda inersion, kontakt va filtrlash usullaridan foydalaniladi
- ❑ Havо chang zarrachalaridan ikki yoki uch bosqichda tozalanadi

# Dvigatellarning ta'minlash tizimi

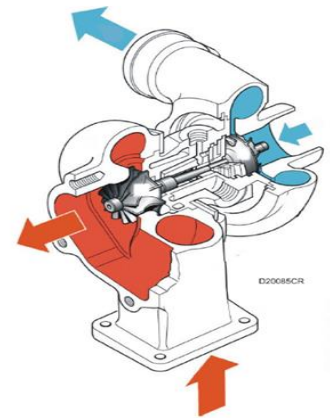


# Dizelning ta'minlash tizimi



## Turbokompressor

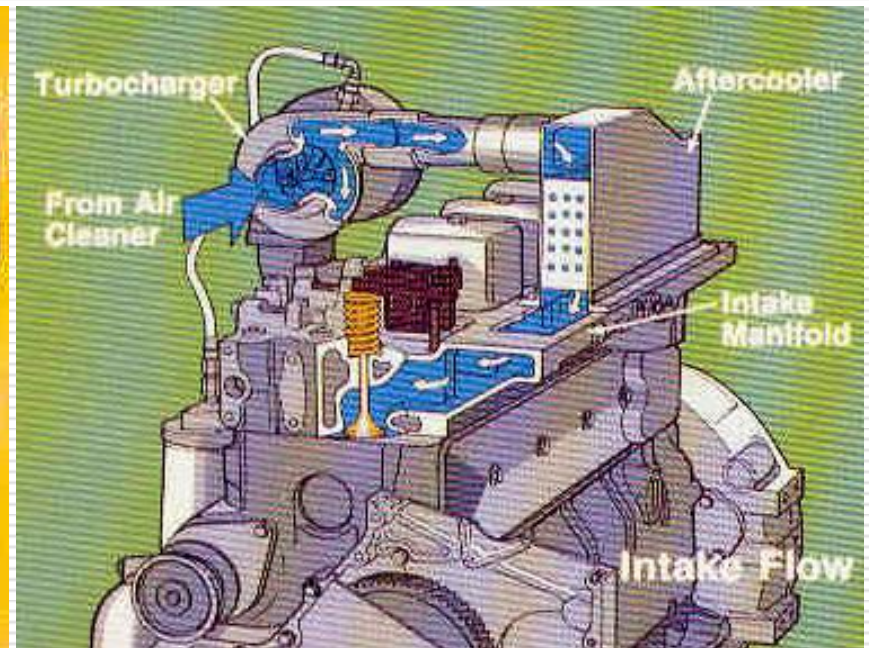
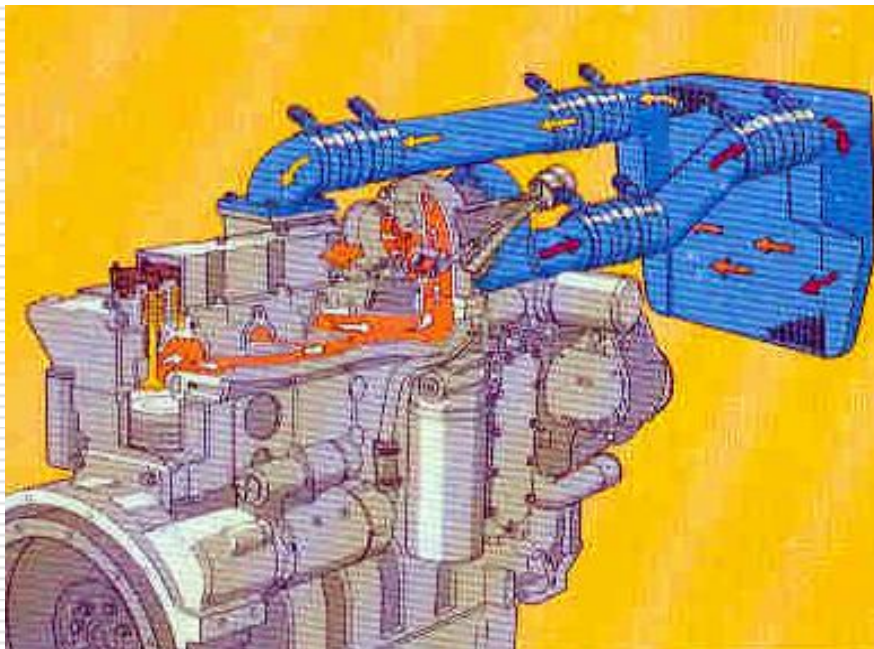
- ❑ silindrlarga havoni bosim ostida kiritadi
- ❑ yonib bo'lgan gazlar energiyasi hisobiga ishlaydi
- ❑ quyidagi qismlardan tashkil topgan
  - ❑ turbina seksiyasi
  - ❑ kompressor seksiyasi
  - ❑ val va vtulkalar



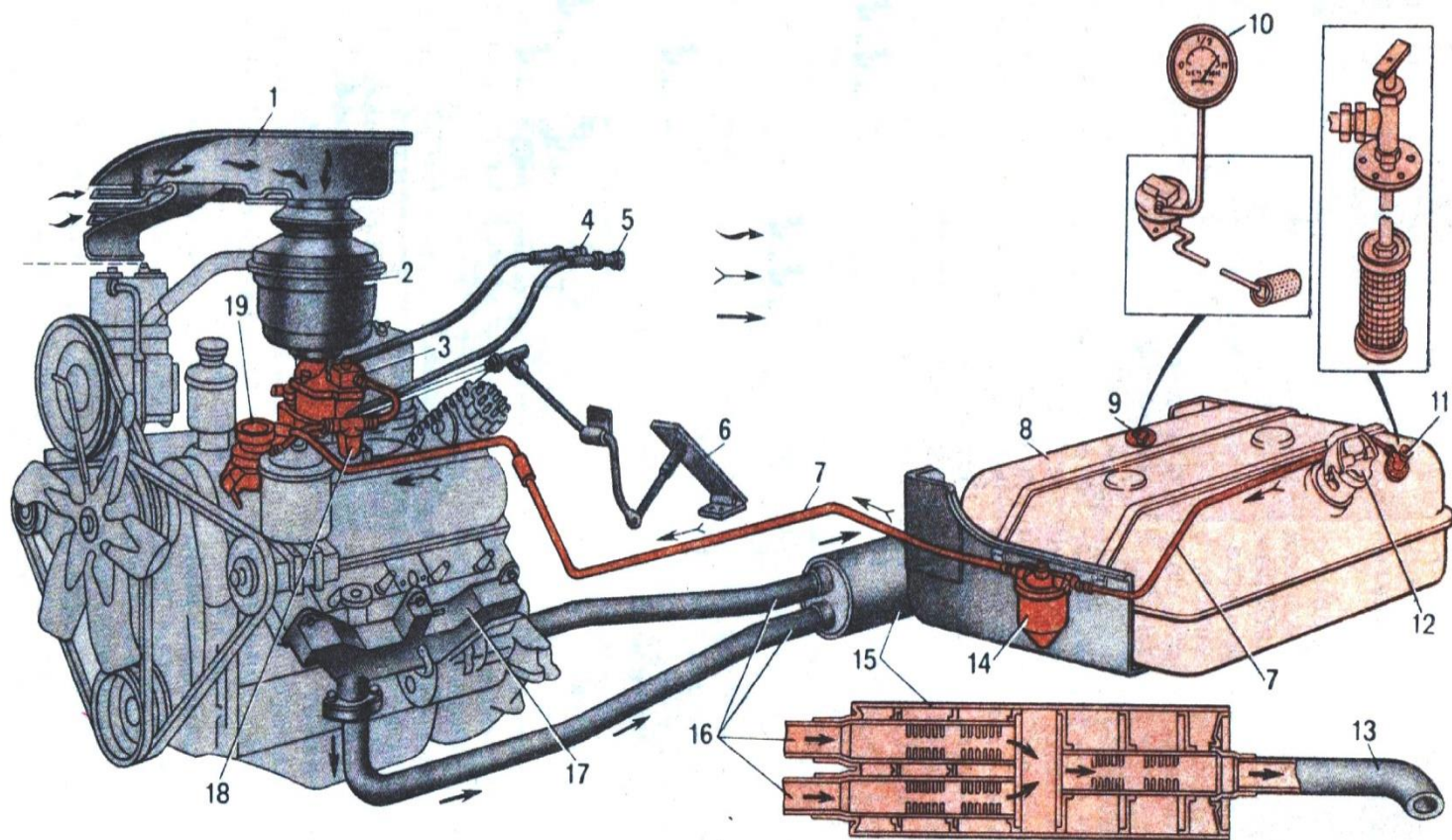


# Dizelning ta'minlash tizimi

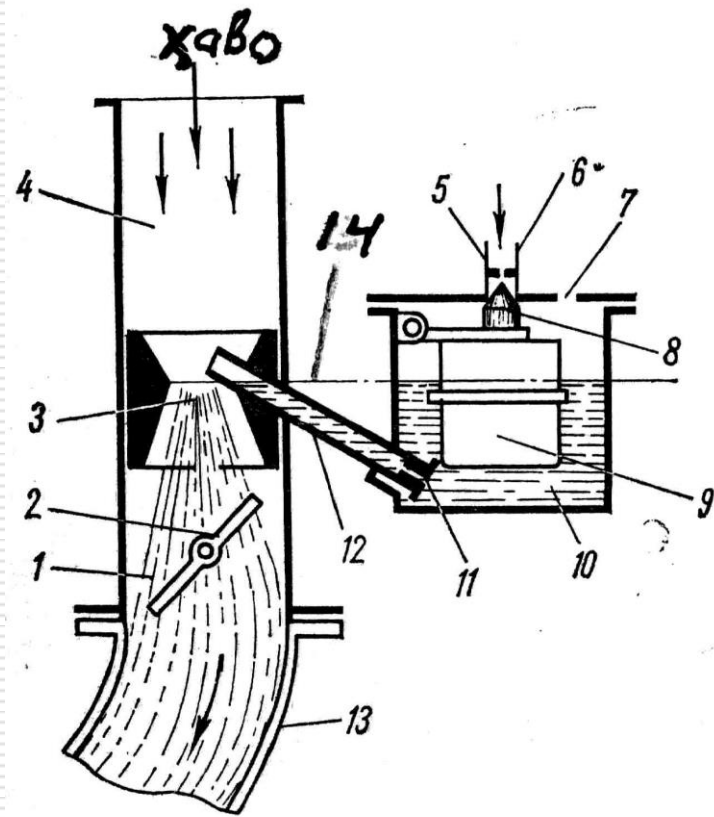
## Havoni oraliq sovutgichlar



# Karbyuratorli dvigatellarning ta'minlash tizimi



# Elementar karbyurator



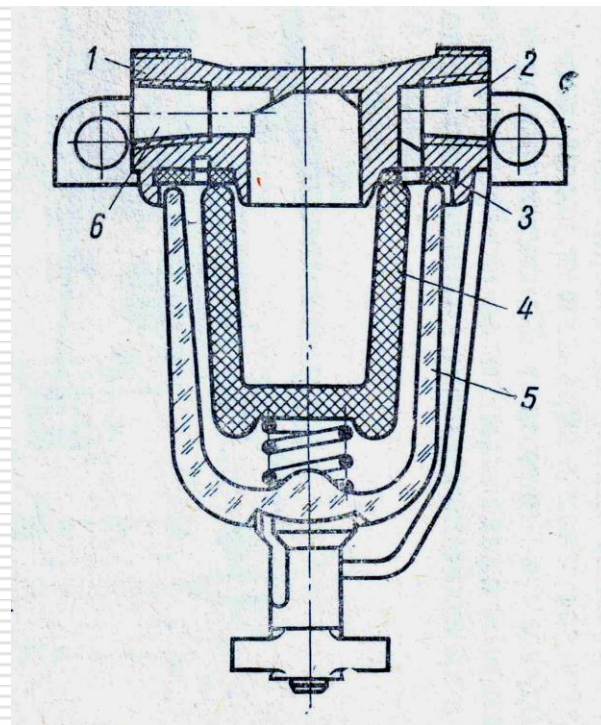
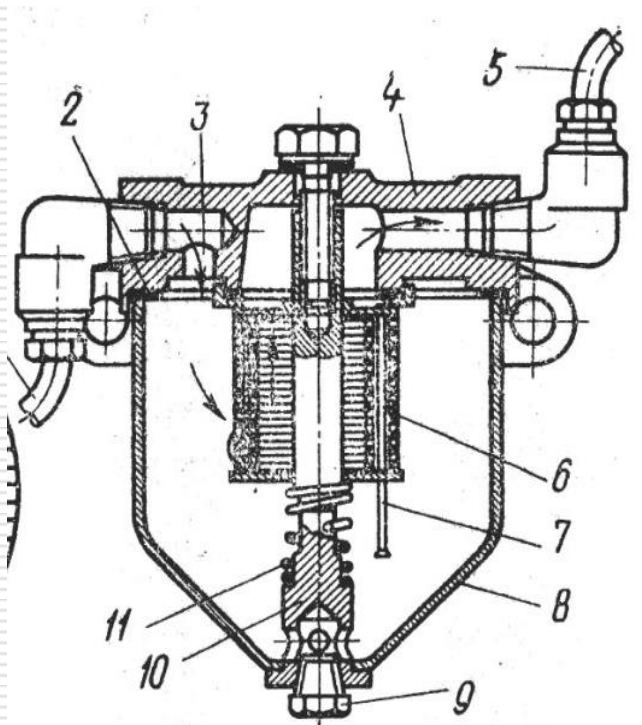
Karbyuratorda yonuvchi aralashma tayyorlanadi

- Poplavokli kamera
- Poplavok
- Ignasimon klapan
- Jikler
- To'zitgich
- Havo quvuri
- Diffuzor
- Drossel zaslonkasi

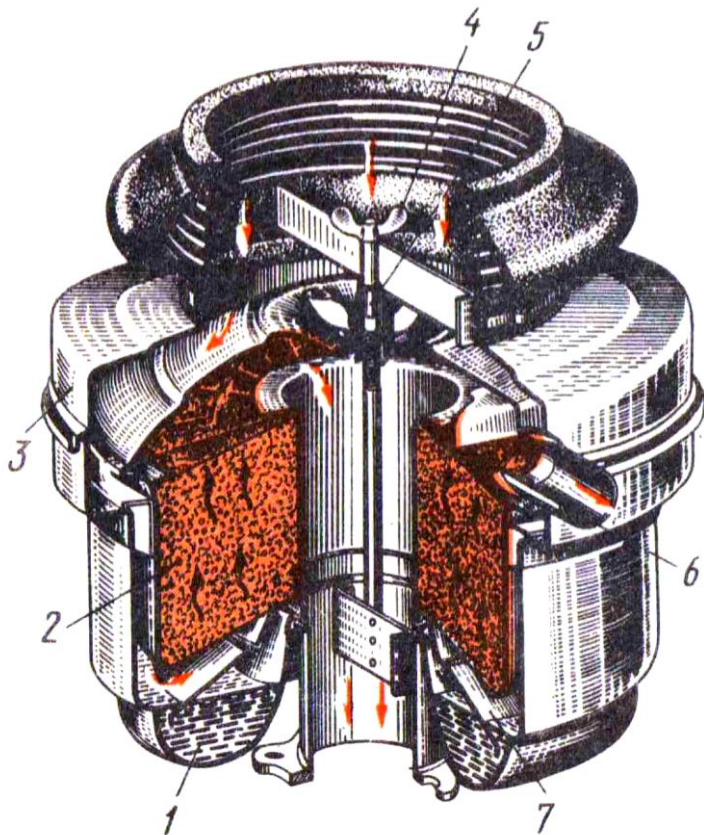


## Karbyuratorli dvigatellarning ta'minlash tizimi

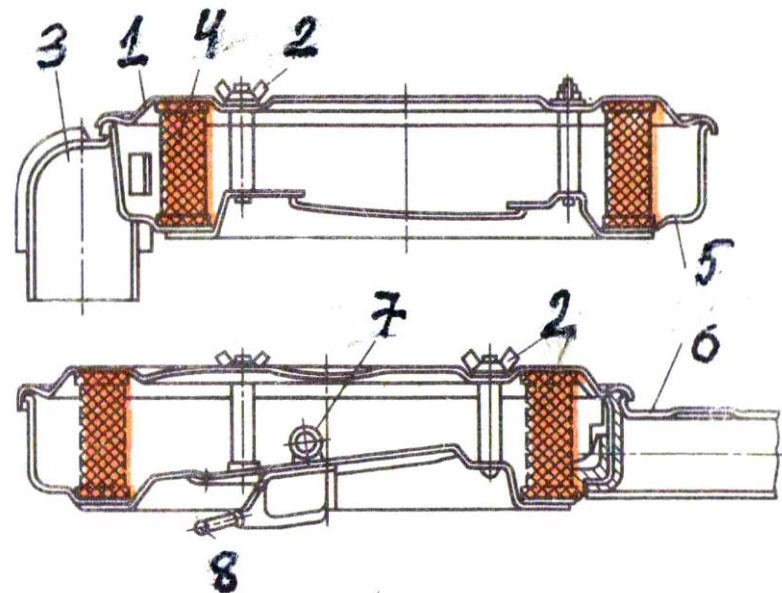
Plastina turidagi (dag'al) va keramik filtrlovchi elementli (mayin) filtrlar



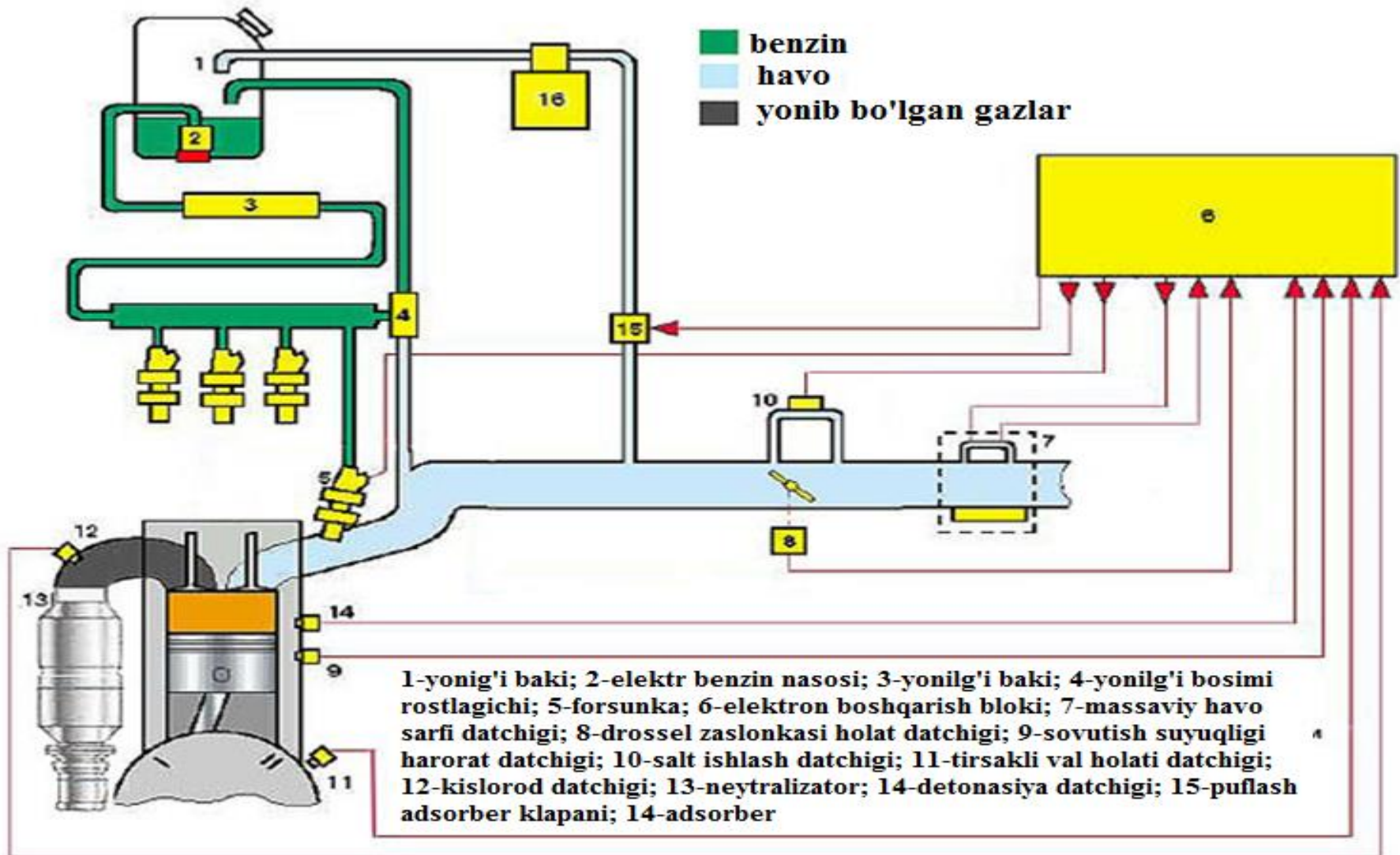
# Karbyuratorli dvigatellarning ta'minlash tizimi



## Havo tozalagichlar

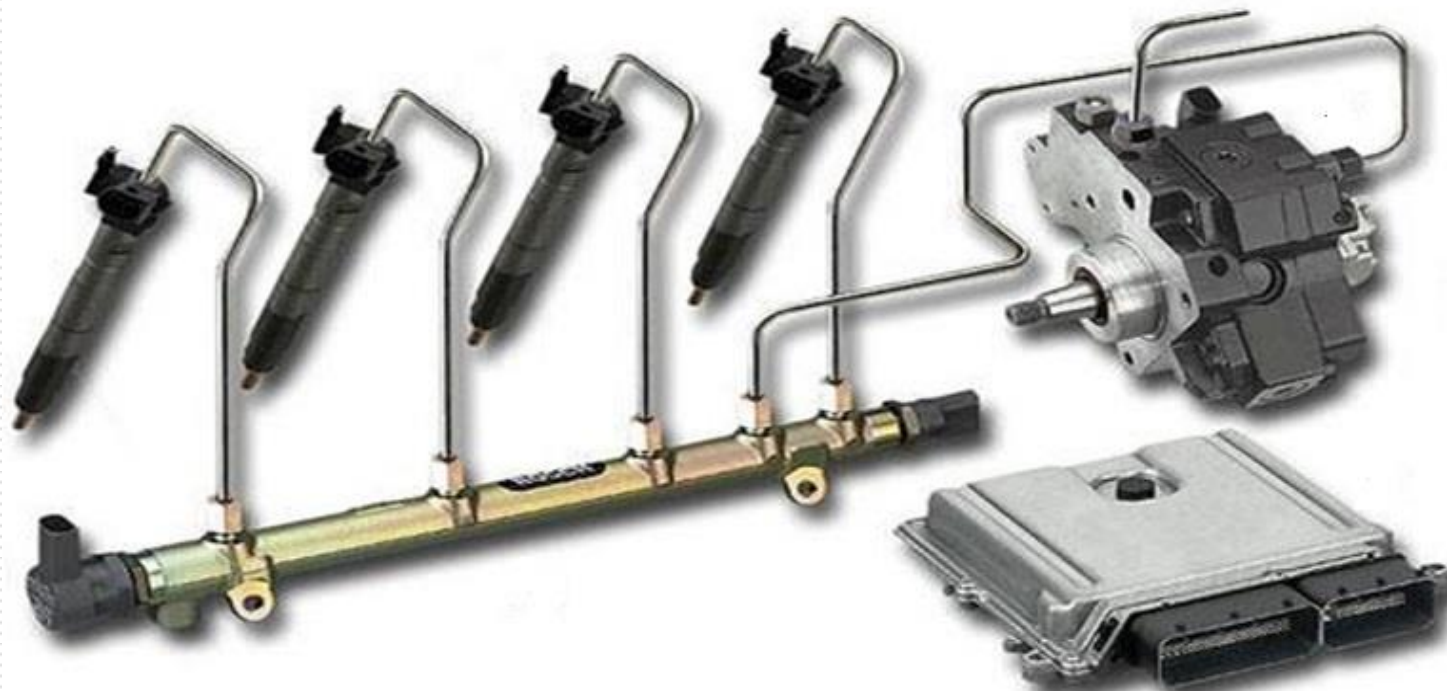


# Benzinda ishlaydigan dvigatellarning injektorli ta'minlash tizimi





## Dizellarda foydalanilgan Common Rail injektorli yonilg'ı bilan ta'minlash tizimi elementlari

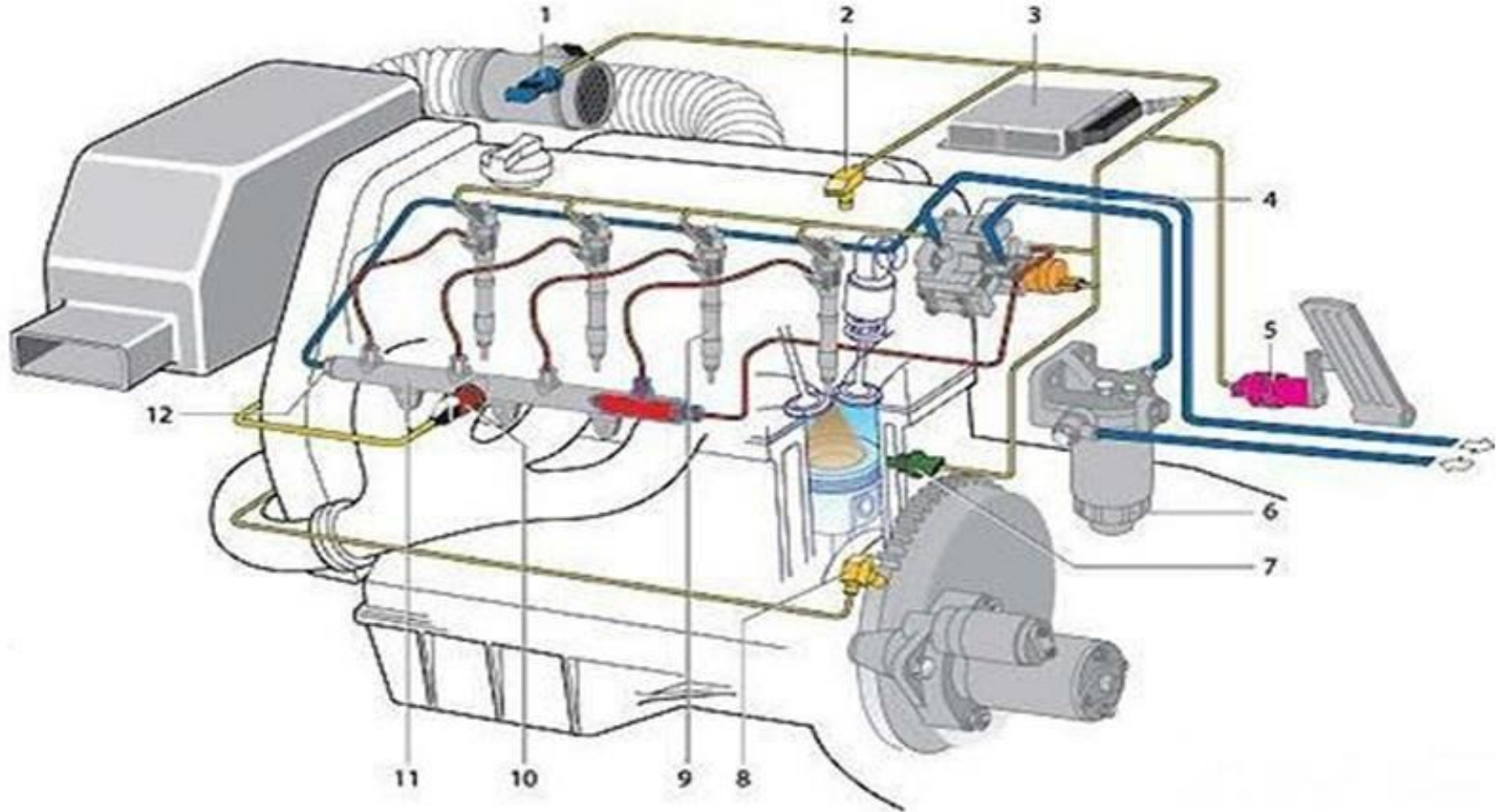


O'zbekistonda ishlatilayotgan Claas va CNH kompaniyalarining **Arion-630S, T-7060** traktorlari dvigatellarida rasmdagiga o'xshash tizimdan foydalanilgan

## Dizellarda foydalanilgan Common Rail injektorli yonilg'ı bilan ta'minlash tizimi

- ❑ Common Rail tizimi 1960 yilda SHvetsariyalik olimlar tomonidan ixtiro qilingan, dizellarda 1997 yildan qo'llanila boshlagan
- ❑ Bu tizimda YUBYON faqat yonilg'ini katta bosimini hosil qilish uchun kerak
- ❑ Tizimda yonilg'ı katta bosimda (2000-3000 atm) umumiy truba/rampada saqlanadi va u yerdan forsunka/injektorlarga boradi
- ❑ Injektorlar elektromagnit yoki pezoelektrik klapanli ularni ochilib yopilishi elektron blok orqali boshqariladi
- ❑ Elektron blok bir necha datchiklardan kelgan ma'lumotlarga asoslanib ishlaydi
- ❑ Bu tizimda yonilg'ini bir necha marta purkalishini tashkil qilish mumkin

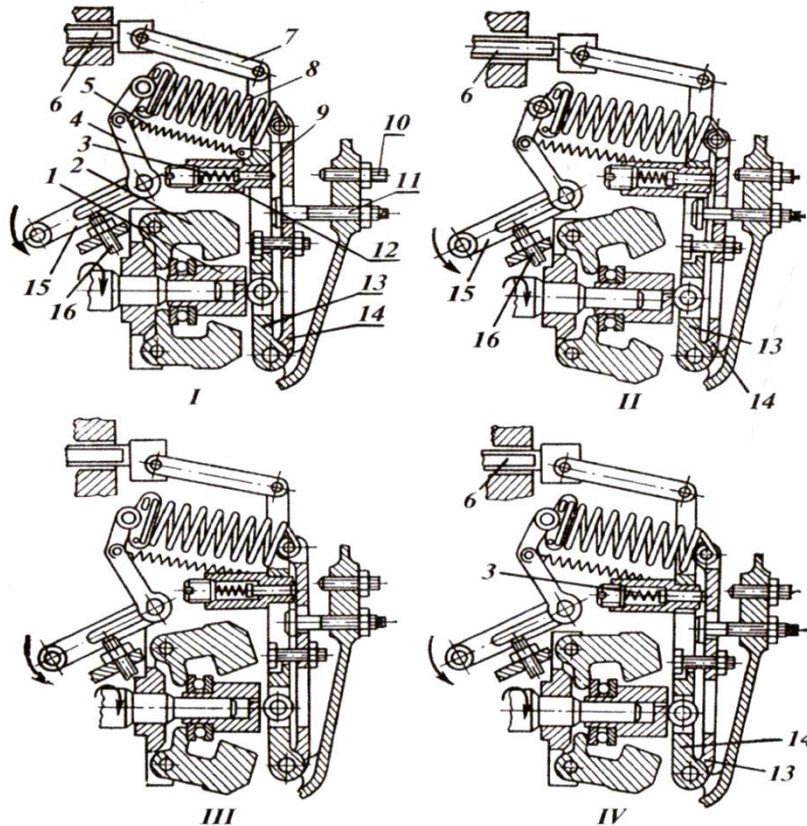
## Dizellarda foydalanilgan Common Rail injektorli yonilg'i bilan ta'minlash tizimi elementlari



1-havo datchigi; 2-gaz taqsimlash vali holatini ko'rsatuvchi datchik; 3-elektron boshqaruv blogi; 4-YUBYON; 5-gaz pedali holati uchun datchik; 6-yonilg'i filtri; 7-sovituvchi suyuqlik temperaturasi datchigi; 8-tirsakli val holatini ko'rsatuvchi datchik; 9-forsunka/injektorlar; 10-yonilg'i bosimi datchigi; 11-yuqori bosim yonilg'i akkumulyatori / rampa; 12-oshiqcha yonilg'ini chiqish klapani



# Dizelning ta'minlash tizimi



## Rostlagichlar

- Dvigatelni kerakli aylanishlar chastotasida ishlashini ta'minlash uchun xizmat qiladi
- Pnevmatik, markazdan qochma, pnevmomarkazdan qochma turlari mavjud
- Bir, ikki yoki ko'p rejimli bo'lishi mumkin
- Dizellarda YuBYoN korpusiga maxkamlanadi va nasos reykasiga bevosita ta'sir qiladi

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**Savollar . . .**

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