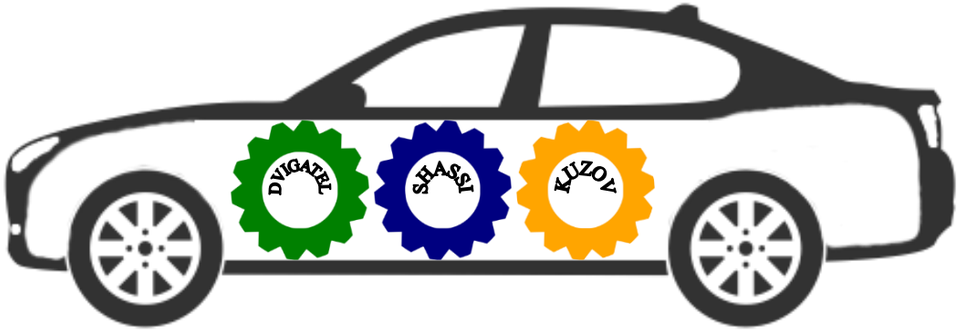
VEHICLES CONSTRUCTION

AVTOMOBILLAR KONSTRUKSIYASI



9th Topic: Transmission. Clutch.

(9-Mavzu: Transmissiya. Ilashish muftasi.)

Part 2

Associate Professor: Yusupov Sarvarbek

9-Mavzu: Transmissiya. Ilashish muftasi.

(9th Topic: Transmission. Clutch.)

O‘quv rejasi:

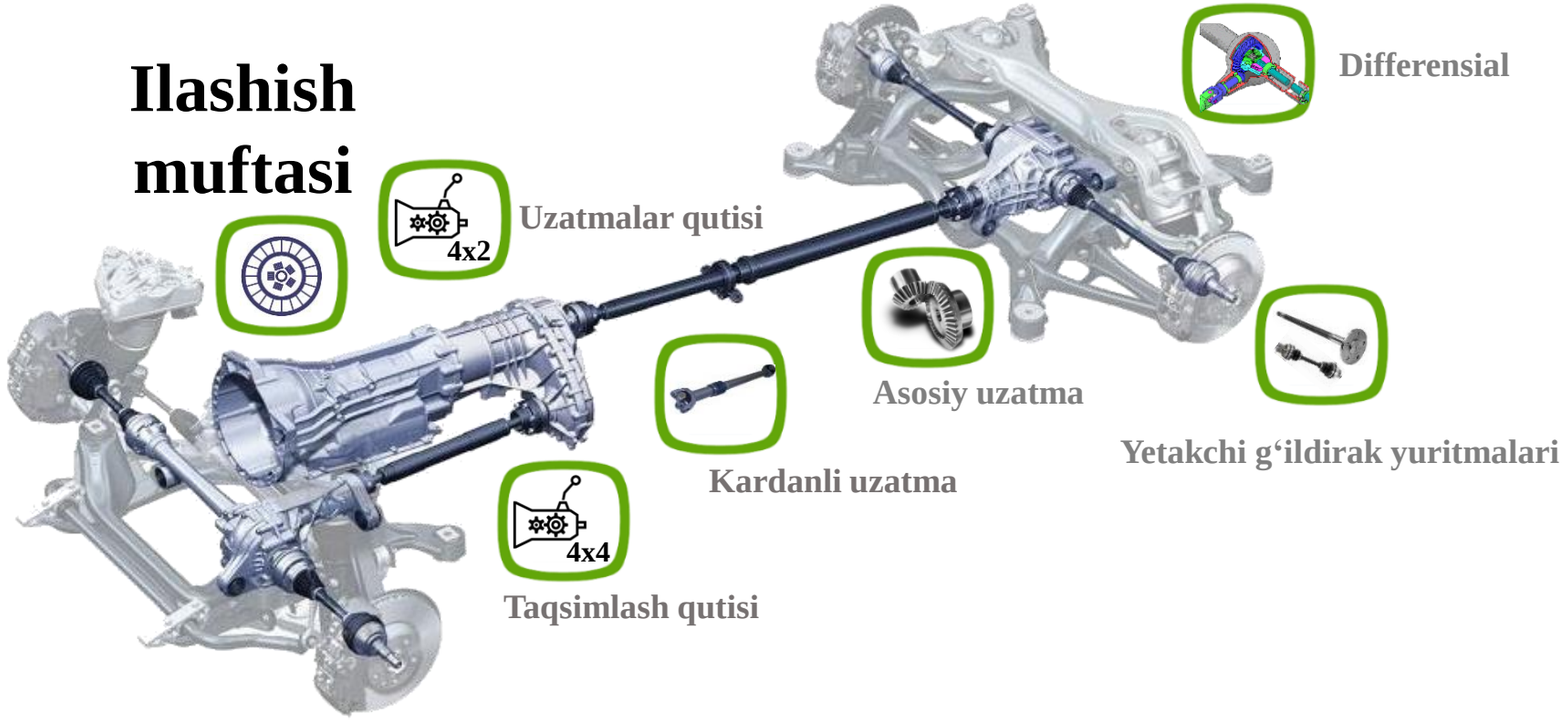
9.1. Transmissiyaning vazifasi va umumiy tashkil etuvchi qismlari.

9.2. Transmissiya konstruksiyasining turlari va ularning ishlashi.

9.3. Ilashish muftasining vazifasi va konstruksiyasi.

9.4. Ilashish muftasining konstruksiya turlari va ularning ishlashi.

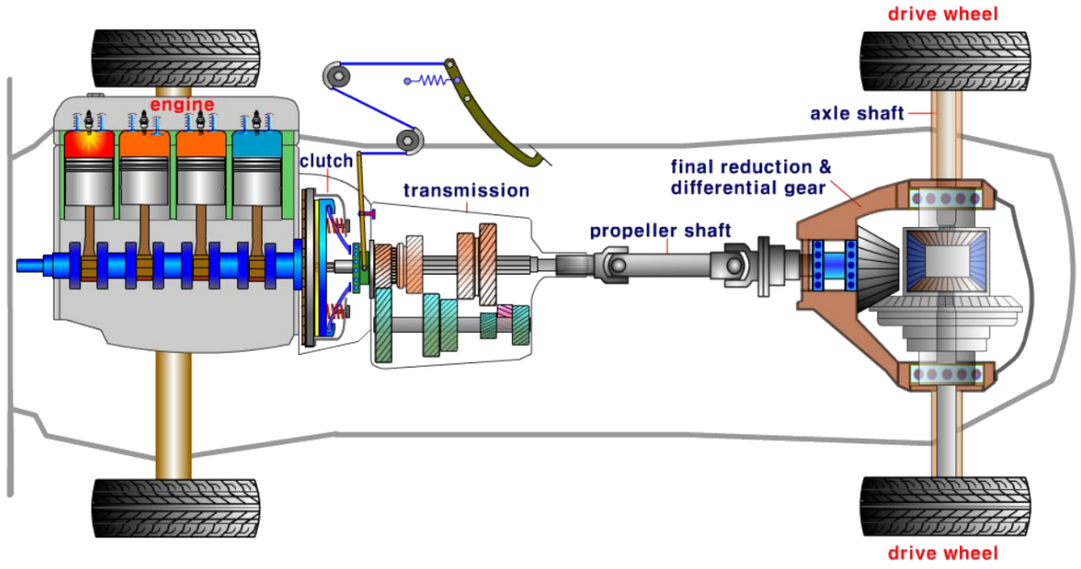
TRANSMISSIYA



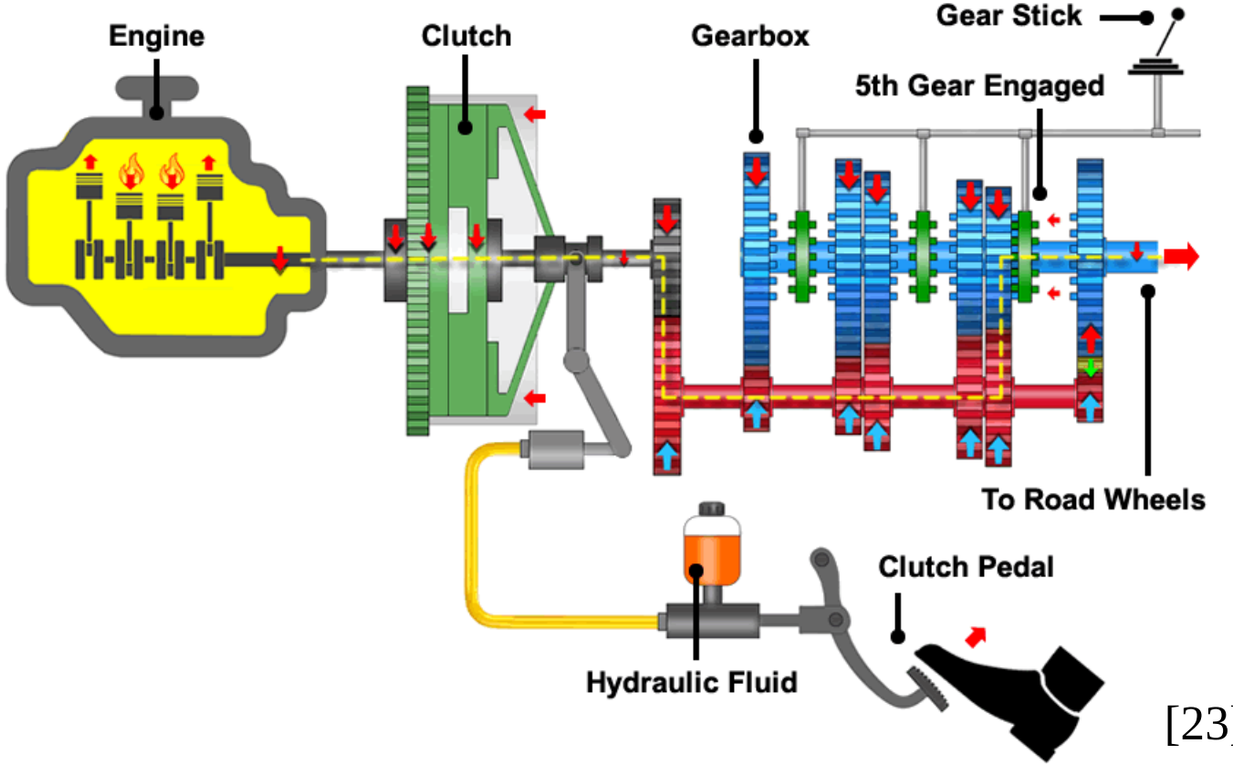
[22]

9.3. Ilashish muftasining vazifasi va konstruksiyasi.

Ma’lumki, avtomobil harakatlanishi uchun dvigatel valida hosil bo‘layotgan **burovchi moment** **oshiqcha** **tebranishlarsiz** **muttasil** **ravishda** **yetakchi g‘ildiraklarga** uzatilishi lozim.



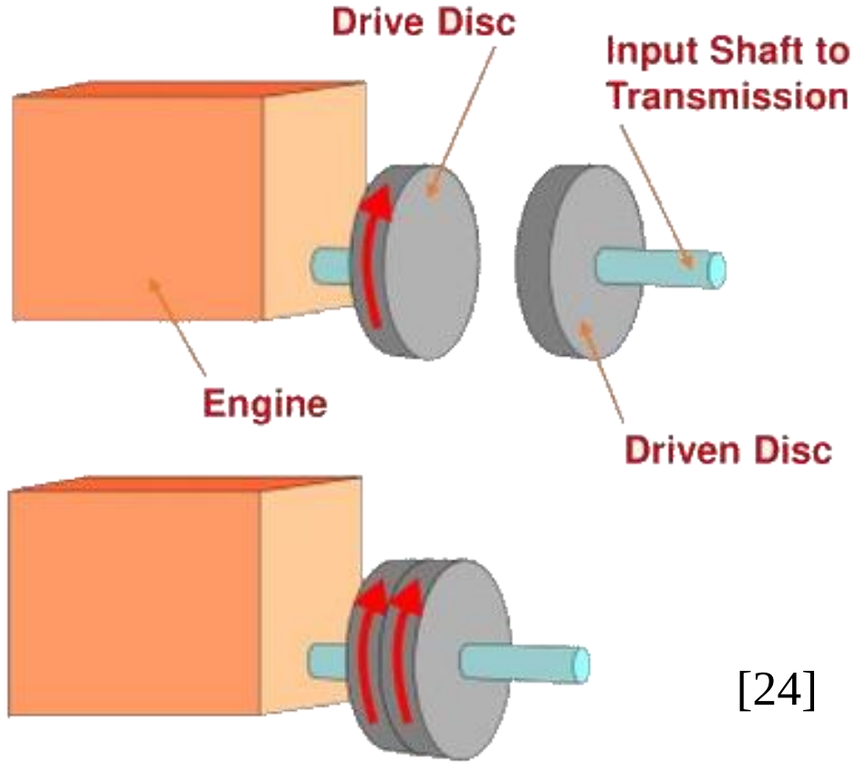
[13]



[23]

Buning uchun avtomobilning o‘rnidan ravon qo‘zg‘alishini, dvigatelning validan yetakchi g‘ildiraklarga uzatilayotgan burovchi momentning qiymatini sekin - asta uzluksiz ko‘paytirishni ta’minlash kerak bo‘ladi.

Aks holda **burovchi momentni muttasil uzatish** jarayoni **yo‘qoladi.**

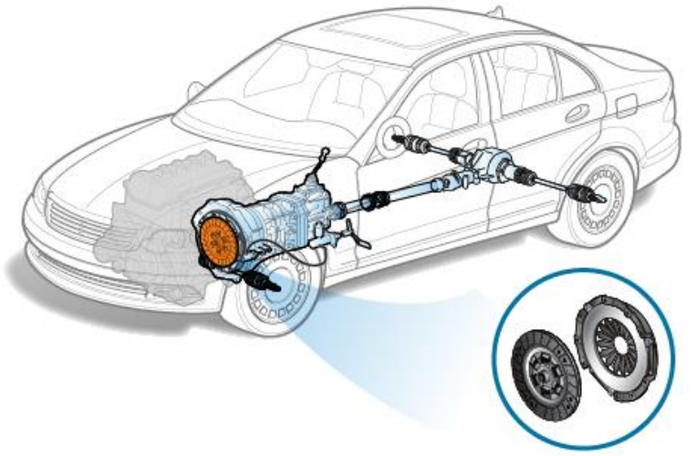


[24]

Vazifasi.

Yuqoridagi ma’lumotlardan kelib chiqadigan bo‘lsak, ilashish muftasi quyidagi funksional vazifalarni bajaradi:

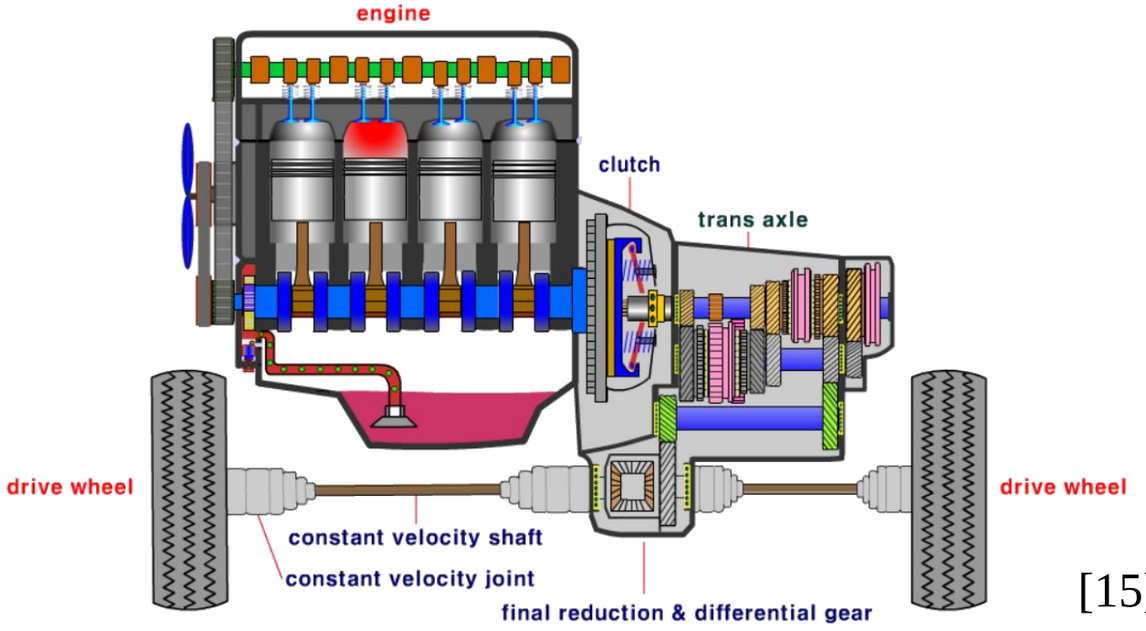
1) Dvigatel tirsakli valini uzatmalar qutisidan vaqtincha ajratish va ravon ulash.



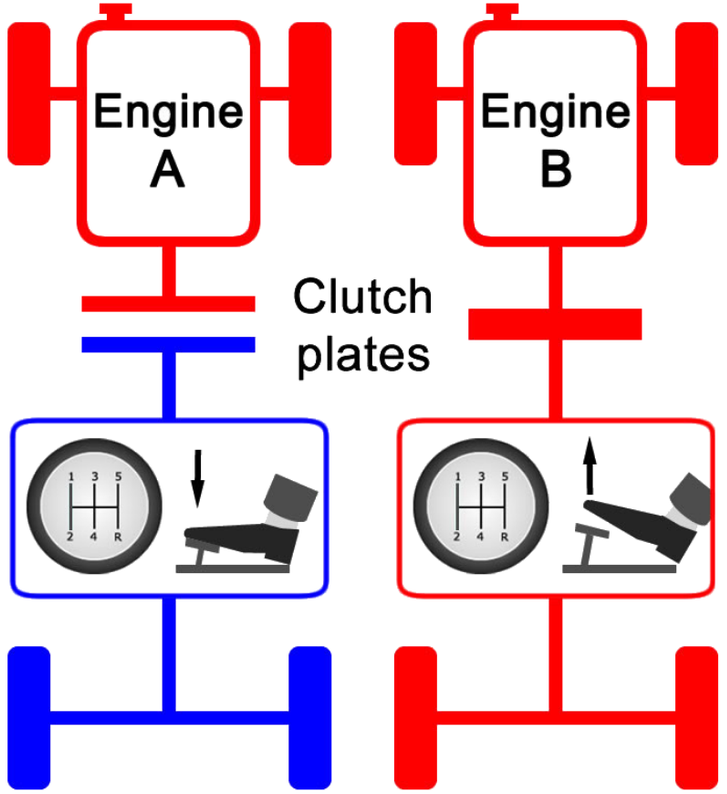
- **Avtomobilning ravon qo‘zg‘alishini ta’minlaydi;**
- **Detallardagi yuklanishlarni oshirmay, pog‘onalarni almashtirishni ta’minlaydi;**
- **Dvigatelni o‘chirmay turib avtomobilni to‘xtatish imkonini beradi.**

[3]

2) Keskin tormozlanish jarayonida transmissiya detallarini ortiqcha yuklanishdan saqlaydi va ularni xizmat muddatini uzaytiradi.

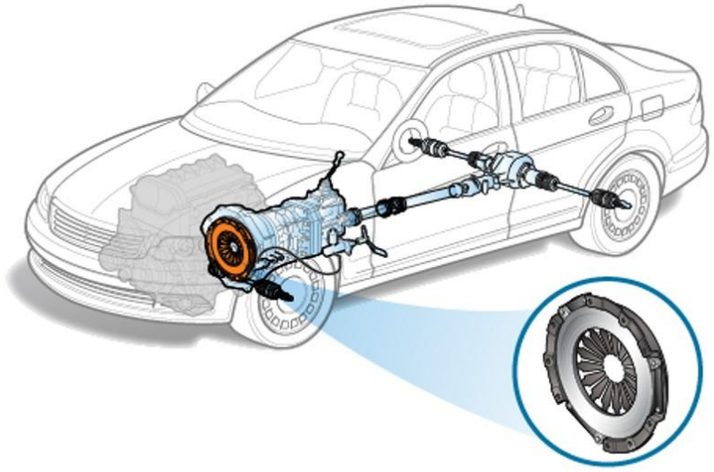


[15]

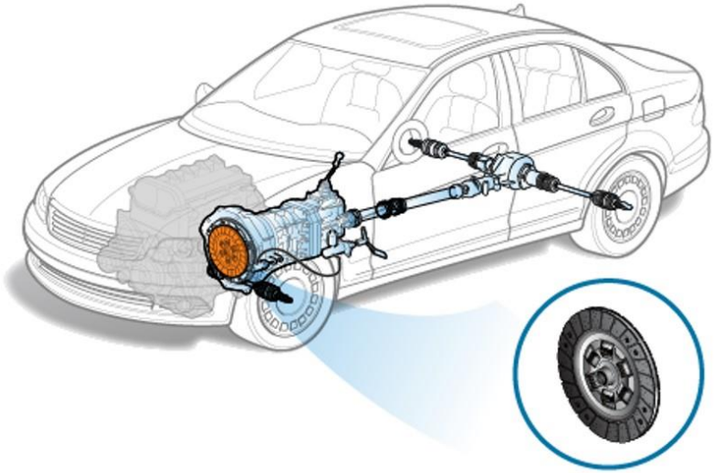


[25]

Ilashish muftasi **yetaklovchi** va **yetaklanuvchi** qismlardan tashkil topgan;

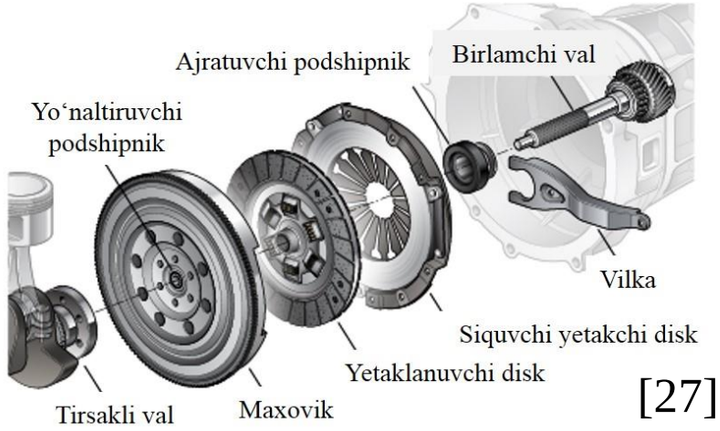


Yetaklovchi qismga tirsakli val bilan bog‘langan (doimo aylanuvchi) detallar kiradi.



[26]

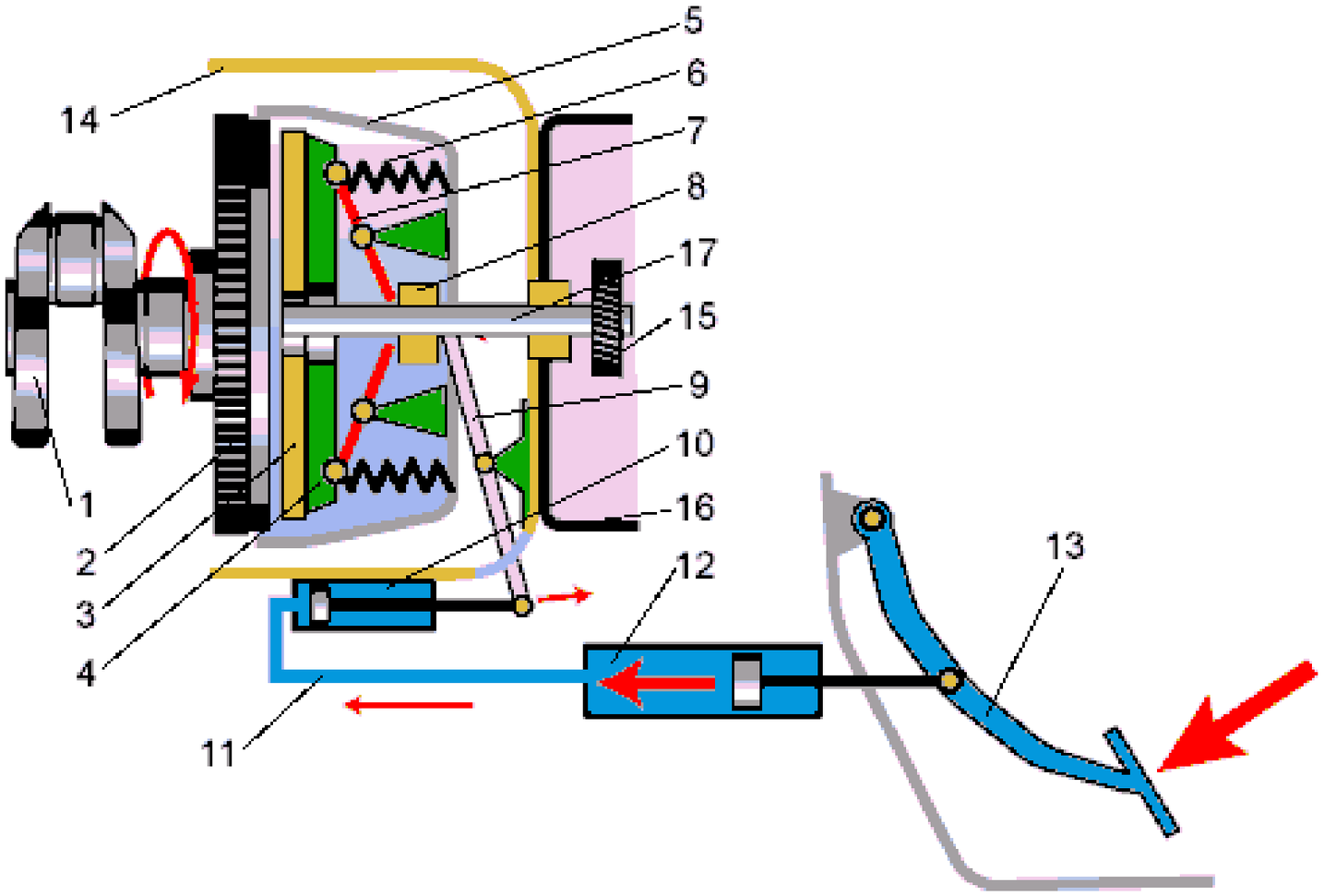
Yetaklanuvchi qismga yetaklanuvchi disk kiradi.



[27]

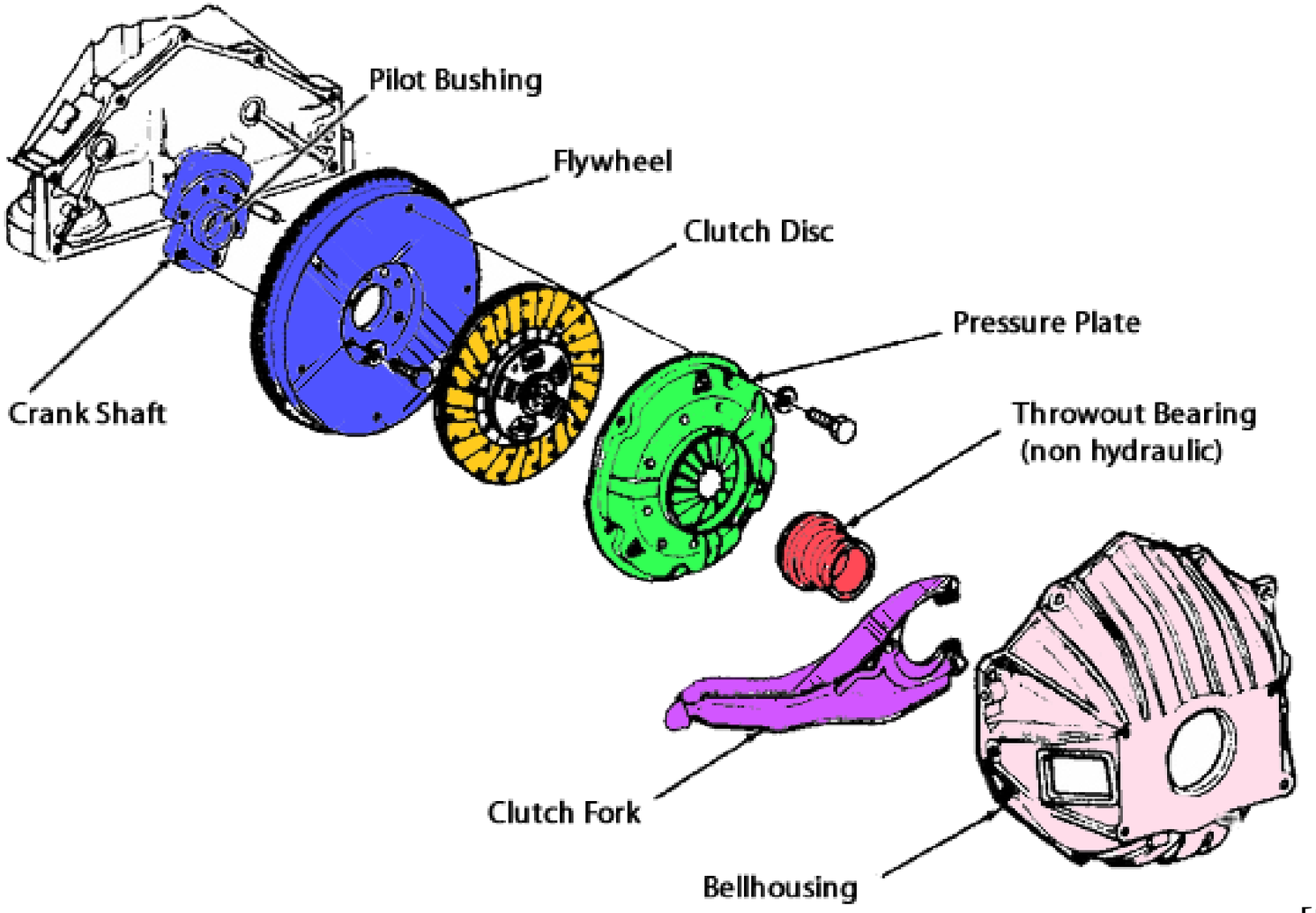
Ilashish muftasining konstruksiyasi.

1-tirsakli val, 2-maxovik, 3-yetaklanuvchi disk, 4-siquvchi disk, 5-g‘ilof, 6-ilashish muftasini ulash prujinalari, 7-richaglar, 8-podshipnikli ajratish muftasi, 9-vilka, 10-ishchi silindr, 11-truba, 12-asosiy silindr, 13-pedal, 14-ilashish muftasining karteri, 15-birlamchi tishli g‘ildirak, 16-uzatmalar qutisining karteri, 17-uzatmalar qutisining birlamchi vali.



[28]

Ilashish muftasining konstruksiyasi.



[29]

9.4. Ilashish muftasining konstruksiya turlari va ularning ishlashi.

Ilashish muftasining turlari:

Yetakchi va yetaklanuvchi qismlar orasidagi bog‘lanish tasnifiga ko‘ra:

- **Friksion;**
- **Markazdan qochma;**
- **Elektromagnit (kukunli);**
- **Vakuumli;**
- **Gidravlik.**

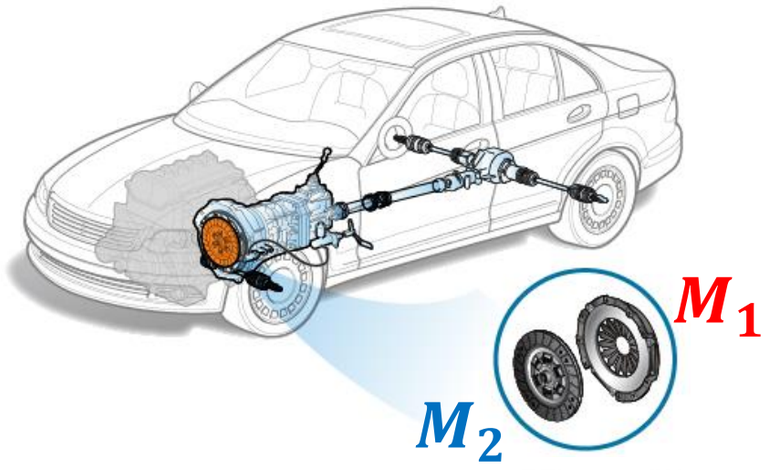
- **Friksion:**
  - **Bir diskli;**
  - **Ko‘p diskli:**
    - ✓ **Quruq;**
    - ✓ **Nam.**
  - **Konusli:**
    - ✓ **Tashqi;**
    - ✓ **Ichki.**

Friksion ilashish muftasi.

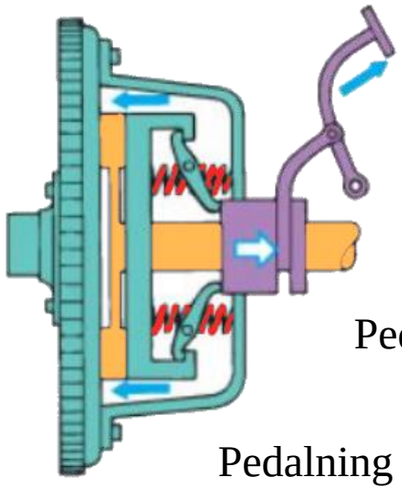
Ularda burovchi moment yetakchi qismdan yetaklanuvchi qismga, shu qismlarning ta’sir yuzalaridagi ilashish kuchi yordamida uzatiladi.

Burovchi moment ilashish muftasi orqali o‘zgarmas holda uzatiladi.

$$M_1 = M_2$$



Ulash



[30]

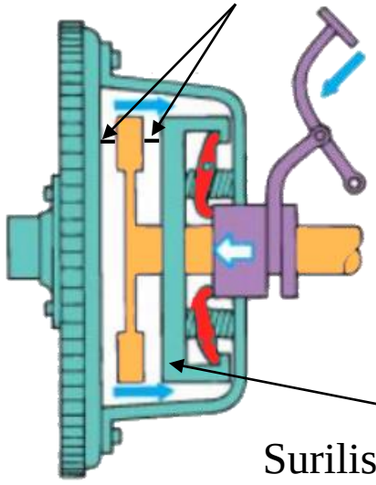
Ajratish

Ilashish muftasi va pedalning erkin yurish yo‘li **30-50 mm**

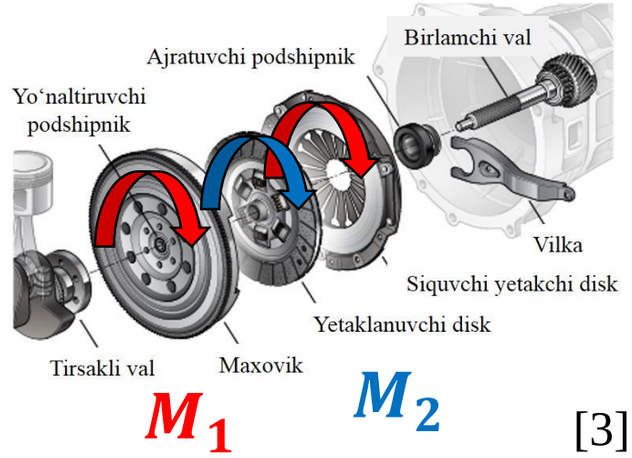
Pedalining to‘la yurish yo‘li **100-180 mm**

Pedalning ishchi yo‘li **70-130 mm**

0,8-1 mm



Surilish yo‘li **1,6-2 mm**

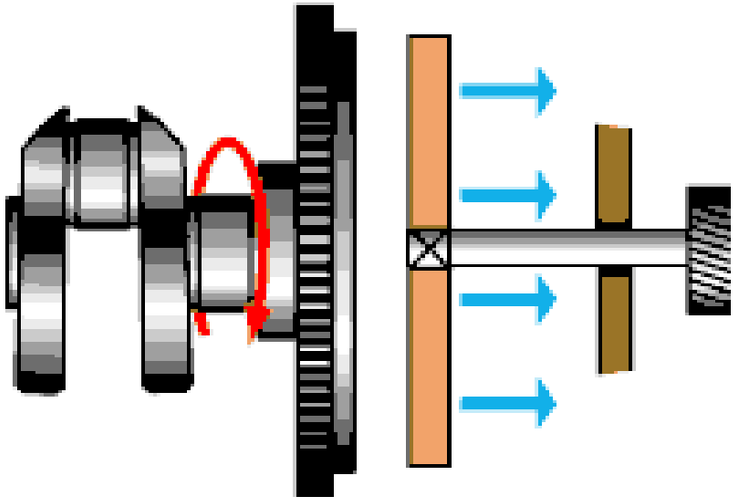


[3]

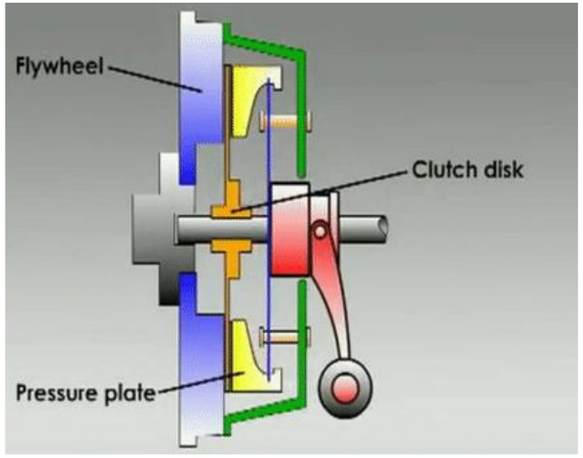
Avtomobilni joyidan qo‘zg‘alish jarayonini ko‘rib chiqamiz.

Avtomobil joyida turgan holda **pedal bosilgan bo‘ladi** va ilashish muftasining **yetaklovchi** va **yetaklanuvchi** qismlari o‘zaro ajratilgan bo‘ladi.

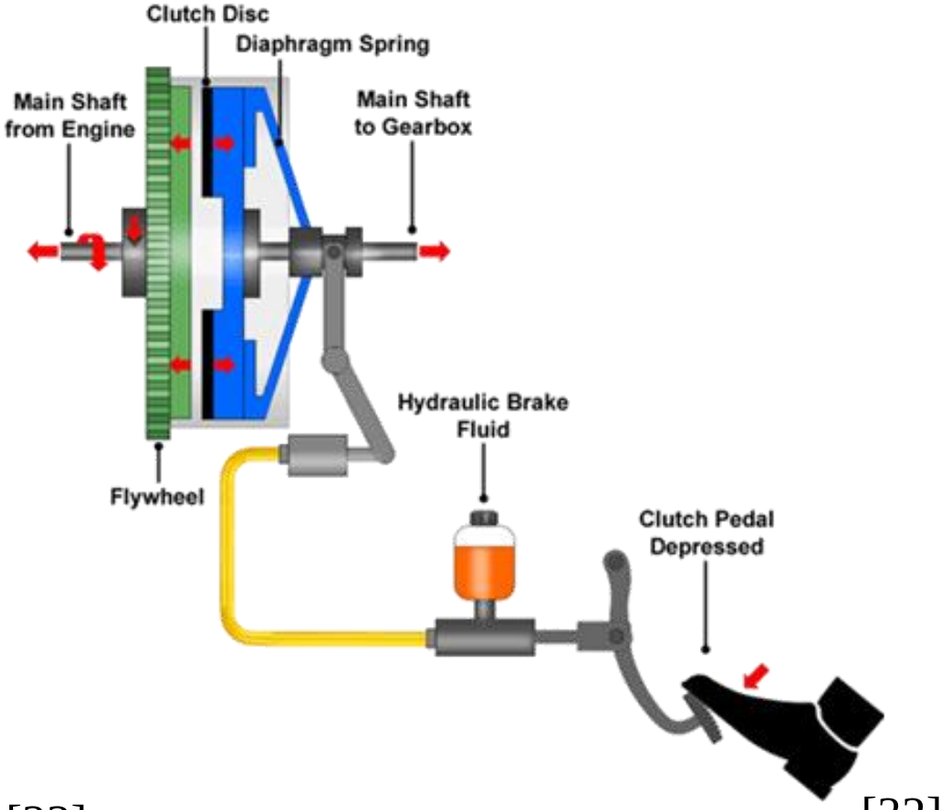
Ilashish muftasi ajralgan



[31]



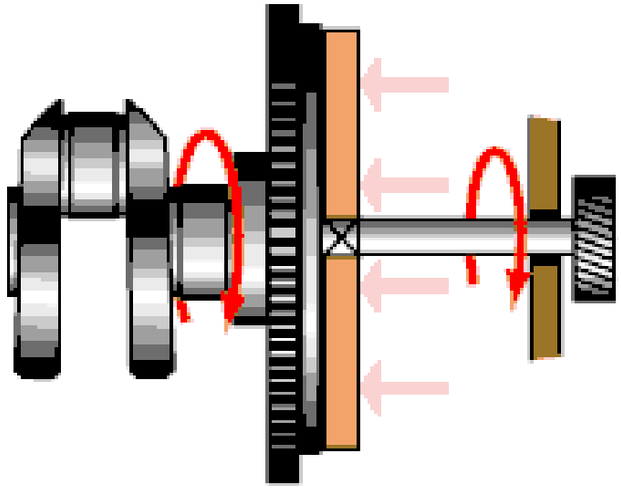
[33]



[32]

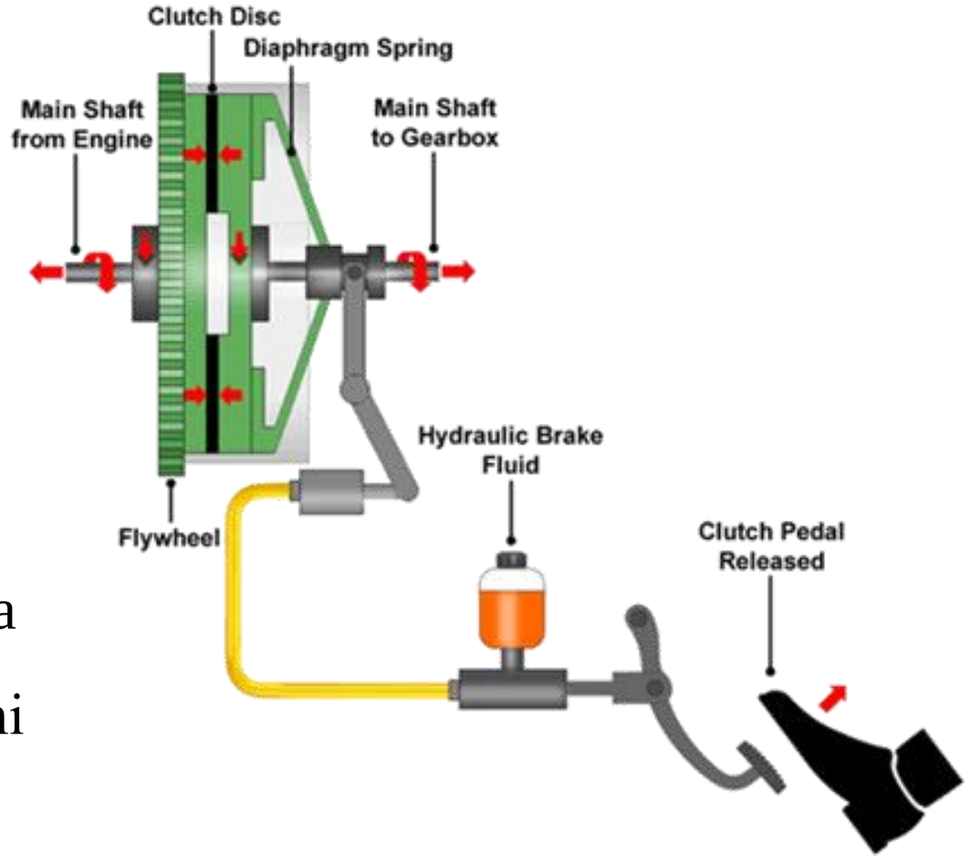
Avtomobil joyidan qo‘zg‘alish jarayonida pedal asta bo‘shatilib, aylanma harakat qilayotgan **maxovikni** va **siquvchi diskni** tinch turgan **yetaklanuvchi disk** bilan birlashtiriladi.

Ilashish muftasi qo‘shilgan



[31]

Ilashish muftasini juda sekin ulash, avtomobilning juda ravon qo‘zg‘alishini ta’minlaydi.



[32]

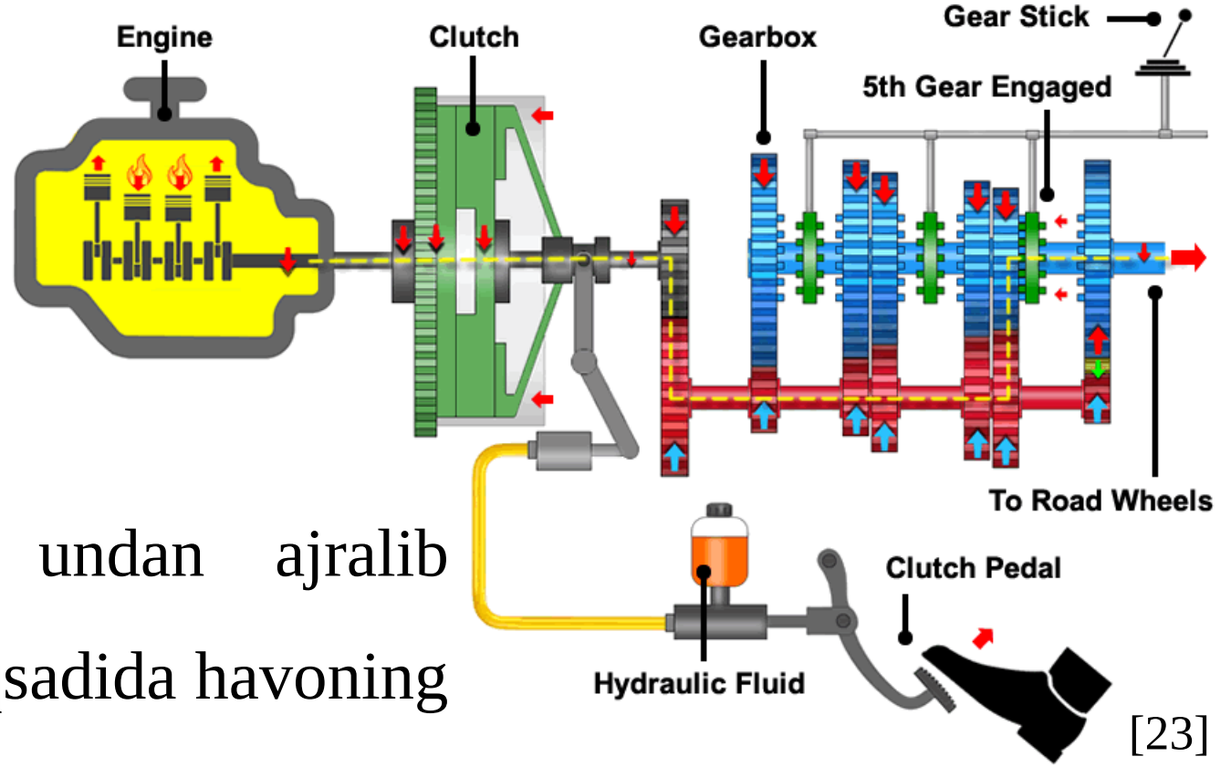
I.M ni ulash jarayonida hosil

bo‘ladigan yuklama va ishqalanish

U.Q da pog‘onalarni o‘zgartirgandan so‘ng,

avtomobilning joyidan qo‘zg‘alishiga

nisbatan ancha kam bo‘ladi.



[23]

Ilashish muftasining ish jarayonida, undan ajralib chiquvchi **issiqlikni** tarqatishni tezlatish maqsadida havoning aylanib turishi uchun g‘ilof va karterda maxsus darchalar ishlangan.

massasining ↑ bo‘lishi ham I.M ning °C ni ↓ yordam beradi.

Maxovik Siquvchi disk

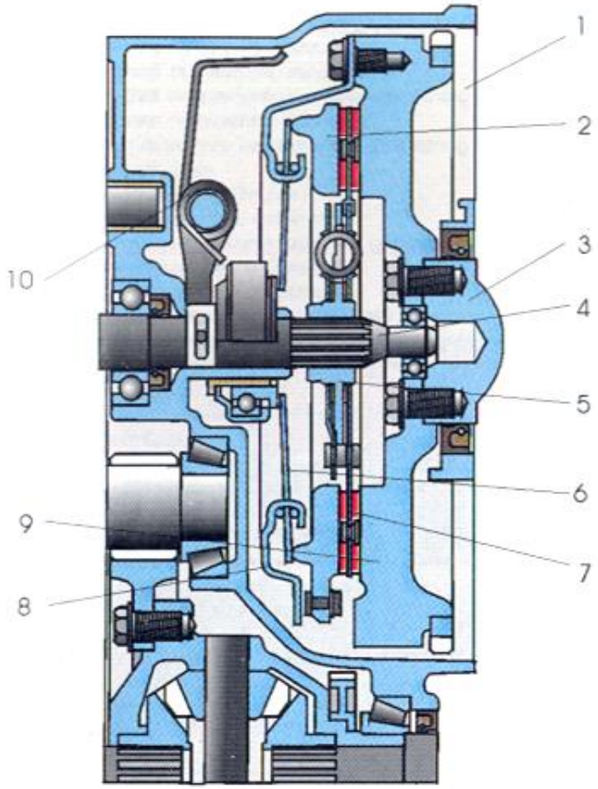
Ilashish muftalari yetaklanuvchi disklarning soniga qarab:

- **bir diskli;**
- **ikki diskli;**
- **ko‘p diskli.**

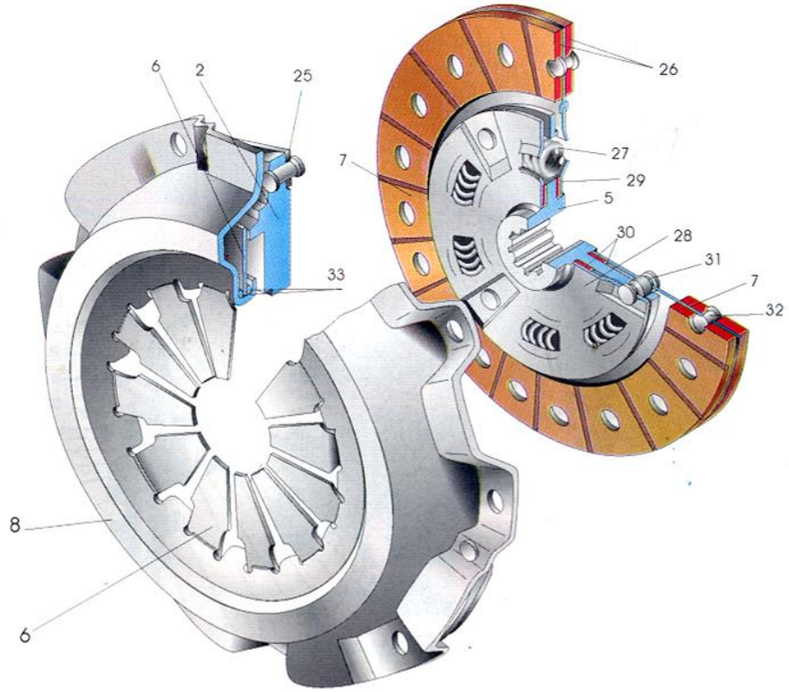
Friksion ilashish muftalarini ulash uchun

- ✓ bitta markaziy prujina yoki bir nechta aylana bo‘yicha joylashgan prujinalar
- ✓ ayrim hollarda suyuqlik bosimi;
- ✓ magnit maydon;
- ✓ markazdan qochma kuchlardan foydalanish mumkin.

Bir diskli friksion ilashish muftasining konstruksiyasi.



1-ilashish muftasining karteri, 2-siquvchi yetakchi disk, 3-tirsakli valning flanetsi, 4-uzatmalar qutisining yetakchi vali, 5-yetaklanuvchi diskning gubchagi, 6-siquvchi prujina, 7-yetaklanuvchi disk, 8-ilashish muftasining qobig‘i, 9-maxovik, 10-ilashish muftasidagi ajratish vilkasining pishangini qaytaruvchi prujina.

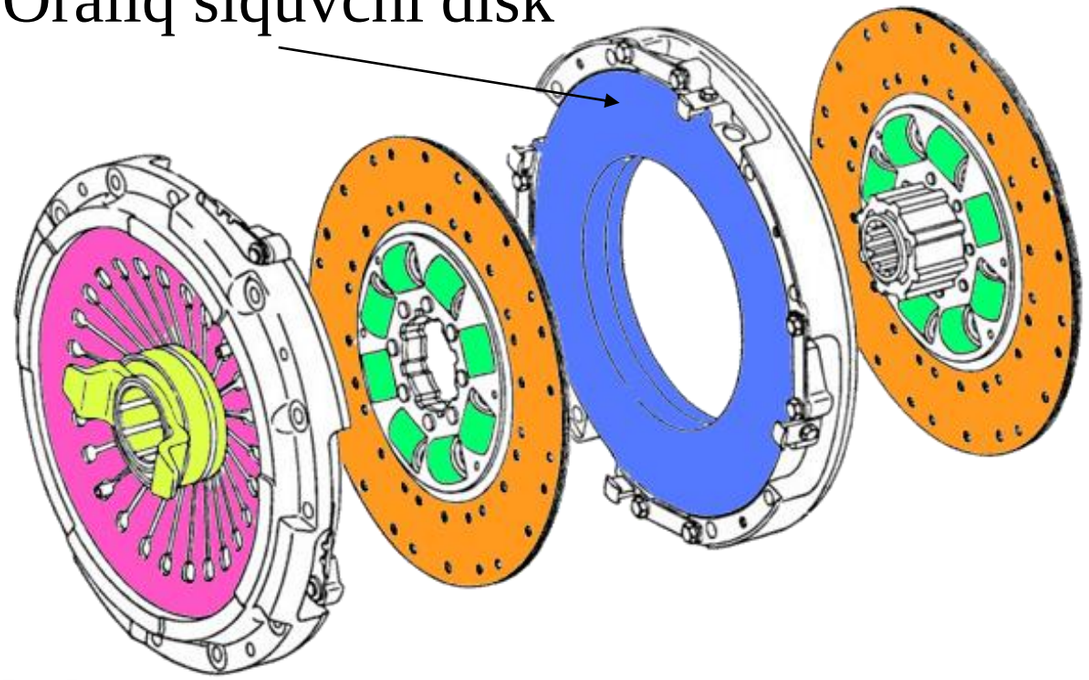


2-siquvchi yetakchi disk, 5-yetaklanuvchi diskning gubchagi, 6-siquvchi prujina, 7-yetaklanuvchi disk, 8-ilashish muftasining qobig‘i, 25-biriktiruvchi plastina, 26-friksion qoplamalar, 27-so‘ndirgichning prujinasi, 28-so‘ndirgichning oldingi plastinasi, 29-so‘ndirgichning ketingi plastinasi, 30-so‘ndirgichning friksion halqalari, 31-so‘ndirgichning parchin mixi, 32-friksion qoplamalarning parchin mixi, 33-siquvchi prujinaning tayanch halqalari.

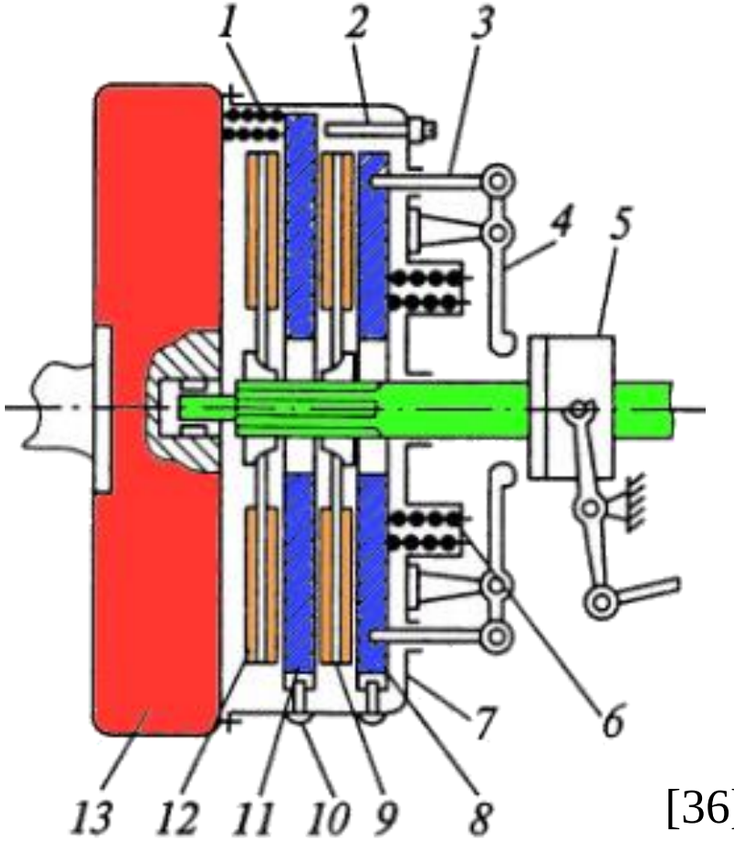
[34]

Ikki diskli friksion ilashish muftasining konstruksiyasi.

Oraliq siquvchi disk



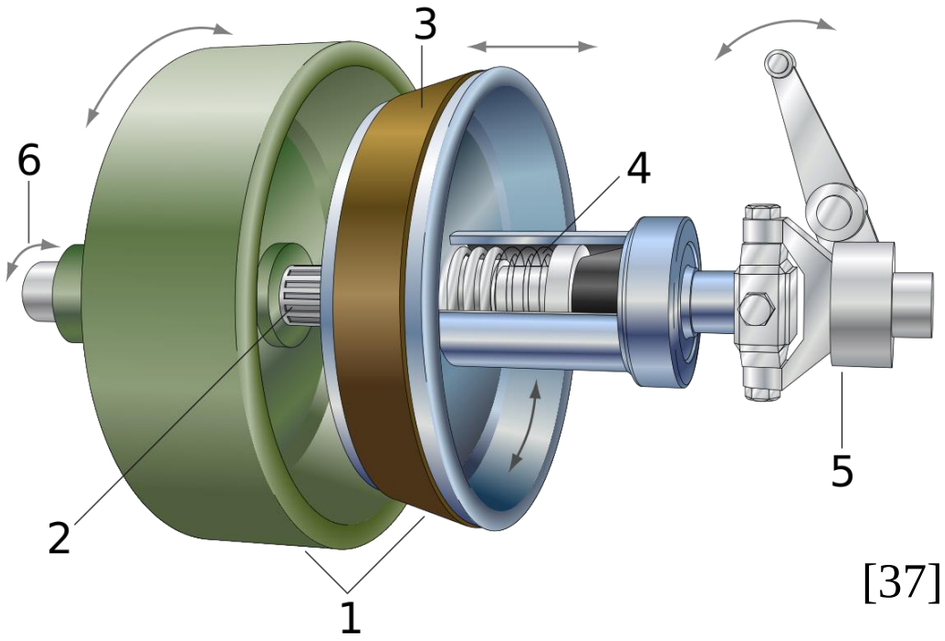
[35]



[36]

1, 6 – пружины; 2 – болт; 3, 10 – пальцы; 4 – рычаг; 5 – муфта;
7 – кожух; 8 – нажимной диск; 9, 12 – ведомые диски;
11 – ведущий диск; 13 – маховик.

Konusli ilashish muftasining konstruksiyasi.



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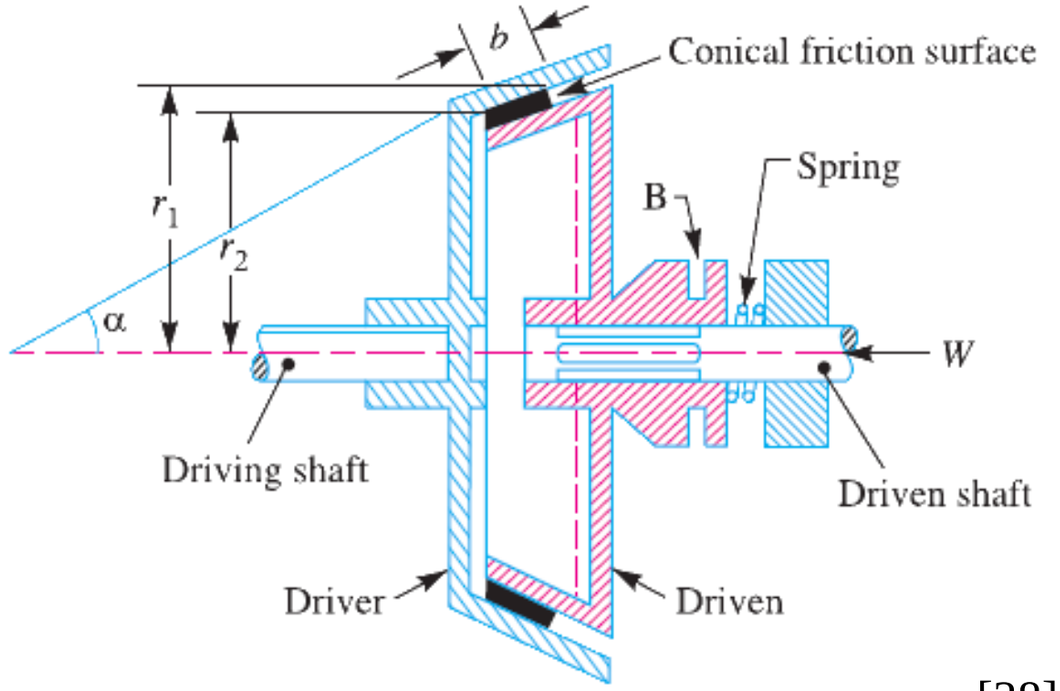


[38]

1. Cones: female cone (green), male cone (blue)
2. Shaft: male cone is sliding on the splines
3. Friction material: usually on female cone, here on male cone
4. Spring: brings the male cone back after using the clutch control
5. Clutch control: separating both cones by pressing
6. Rotating direction: both direction of the axis are possible

Friksion ilashish muftasining yuritma turlari:

- **Mexanik;**
- **Gidravlik;**
- **Elektromagnit.**

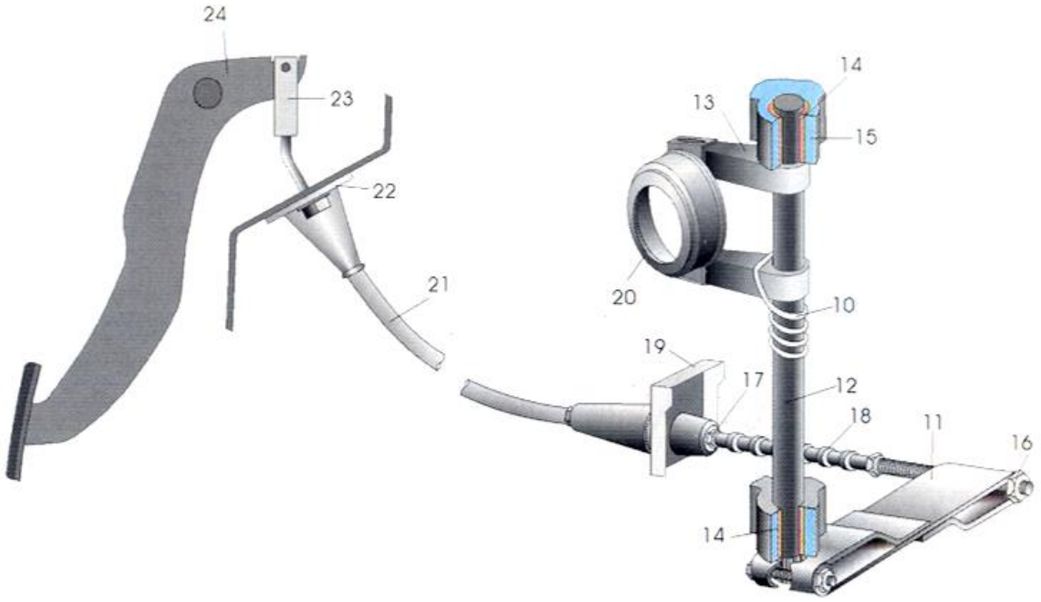
Ko‘pgina yengil va yuk avtomobillarida **mexanik** va **gidravlik** yuritmalar ishlatiladi.

Elektromagnit yuritmalar asosan yengil avtomobillarda ilashish muftasini boshqarishni avtomatlashtirishda qo‘llaniladi.

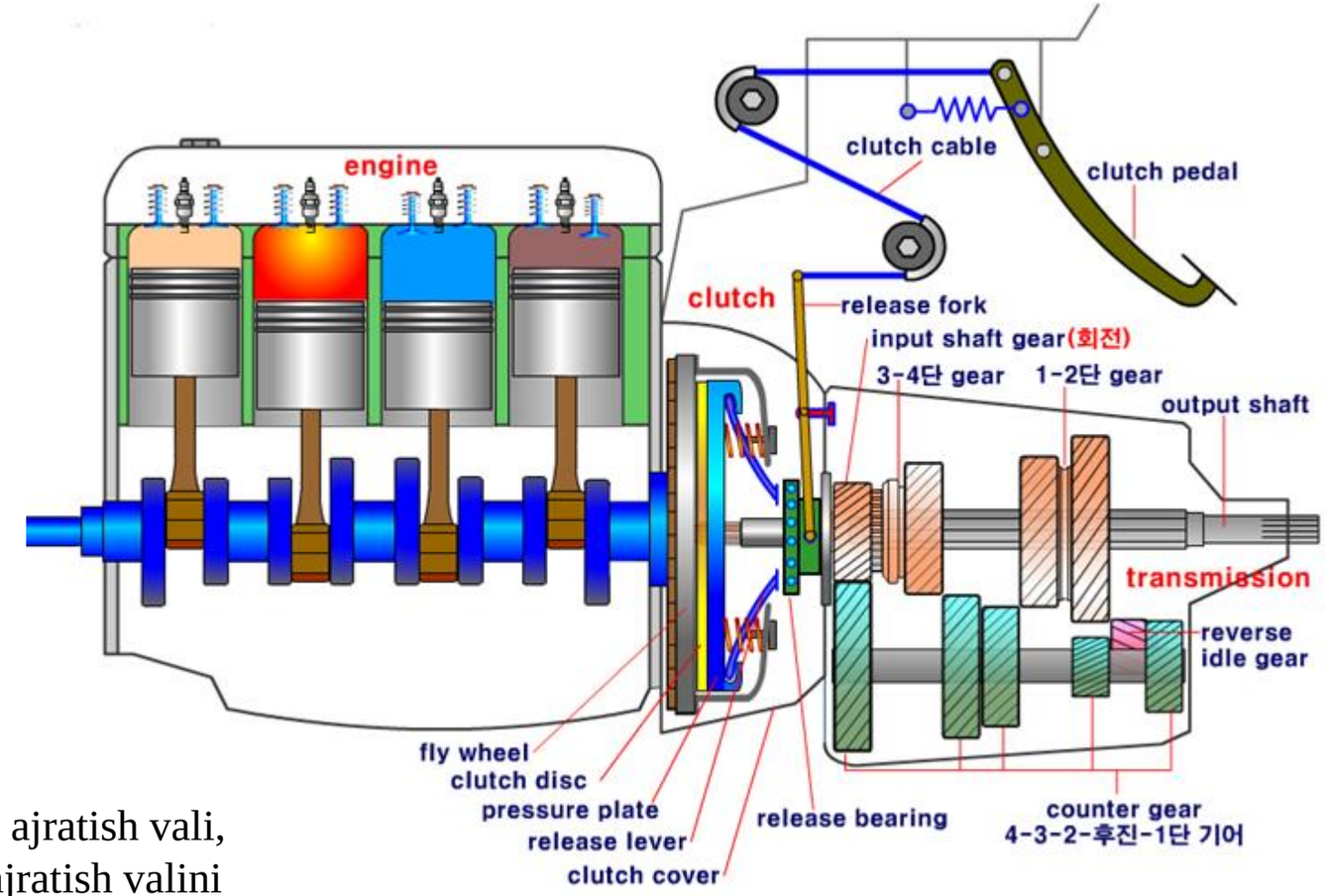
Ilashish muftasini boshqarishni osonlashtirish uchun

- ✓ mexanik (servoprujinalar) pnevmatik yoki
- ✓ vakuumli kuchaytirgichlardan foydalaniladi.

Mexanik yuritmali



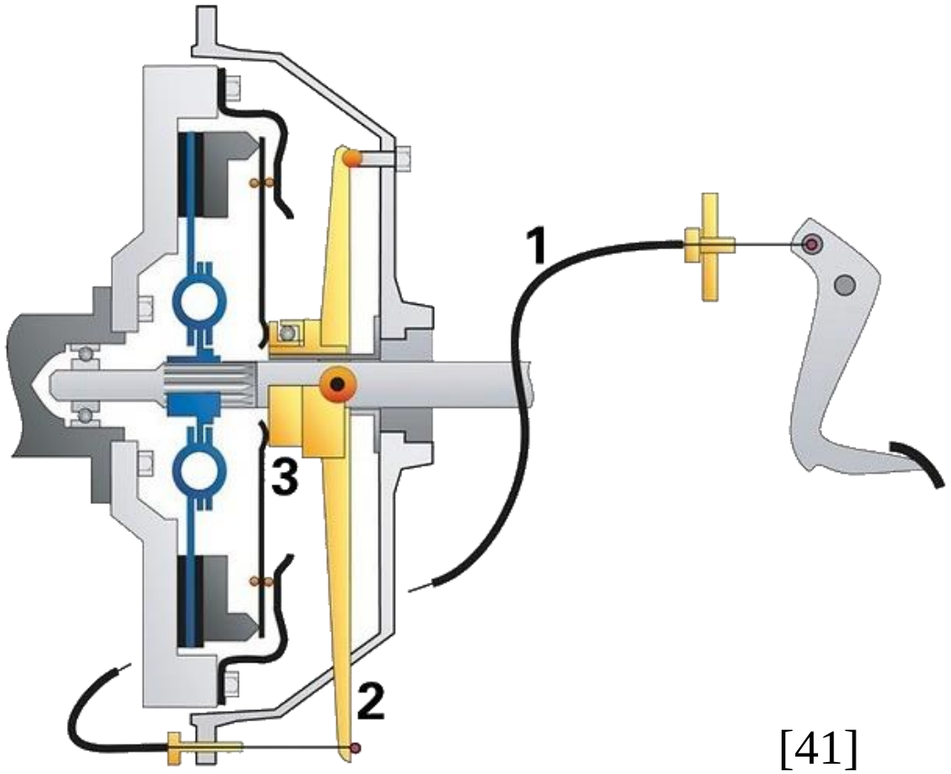
[34]



[39]

11-ilashish muftasini ajratish pishangi, 12-ilashish muftasini ajratish vali, 13-ilashish muftasini ajratish vilkasi, 14-ilashish muftasini ajratish valini vtulkasi, 15-uzatmalar qutisining karteri, 16-rostlovchi gayka, 17-kontrgayka, 18-muhofazalovchi g‘ilof, 19-trosni mahkamlovchi kronshteyn, 20-ajratish muftasi, 21-trosning qobig‘i, 22-tros qobig‘ini mahkamlash buferi, 23-zirak, 24-ajratish pedali.

Mexanik yuritmali

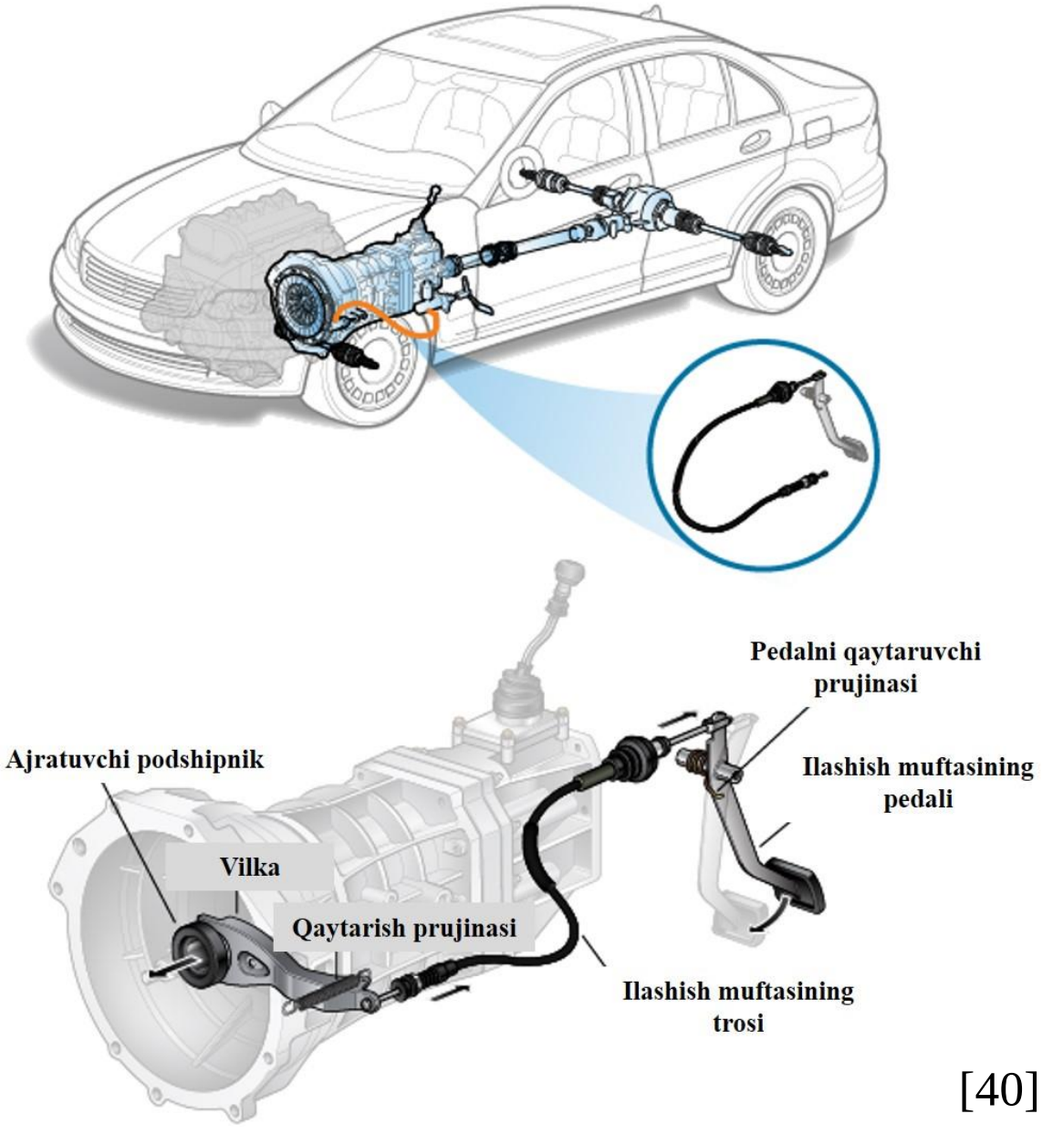


[41]

1-tros,

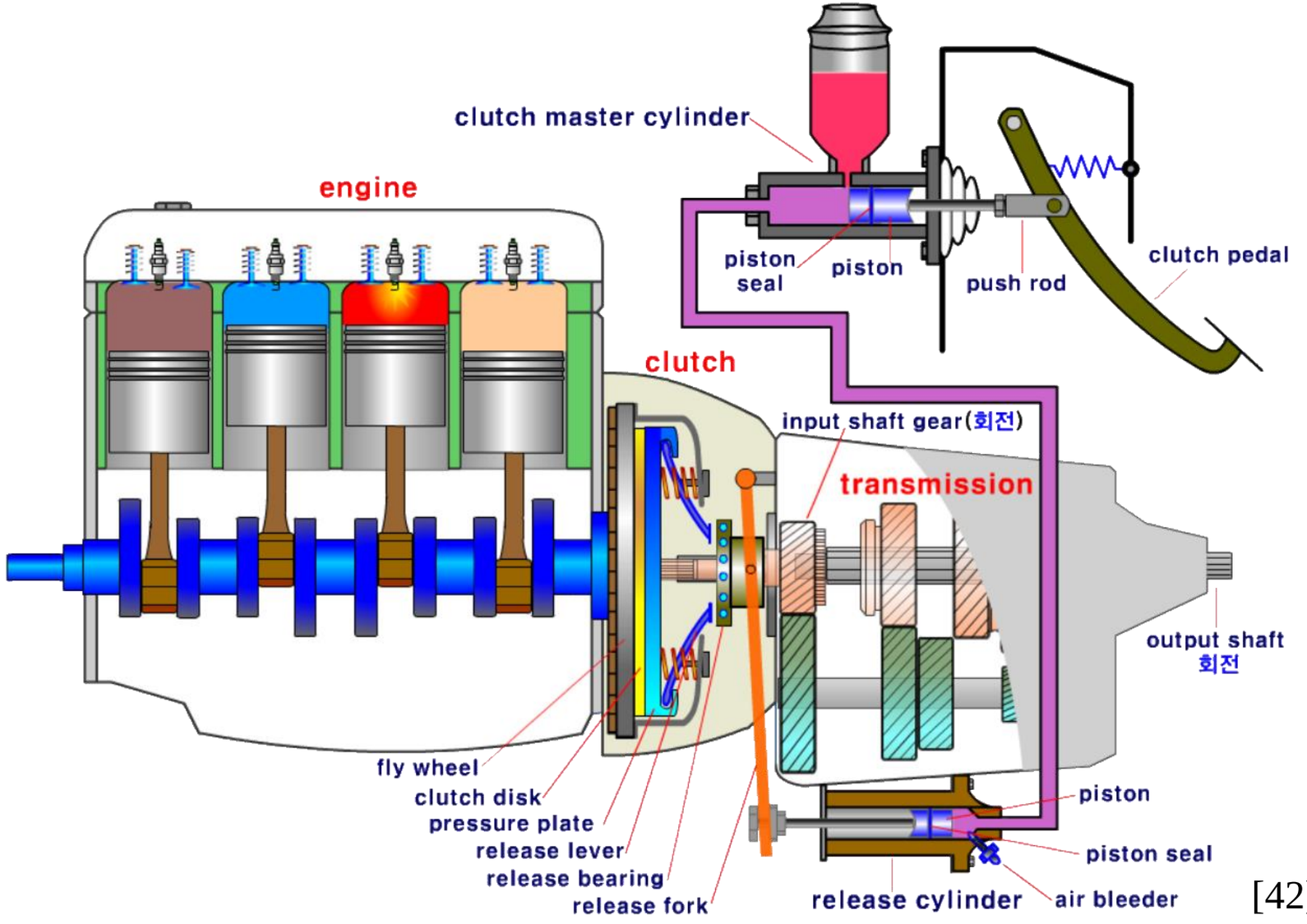
2-ilashish muftasini ajratish vilkasi,

3-ilashish muftasini ajratish muftasi.

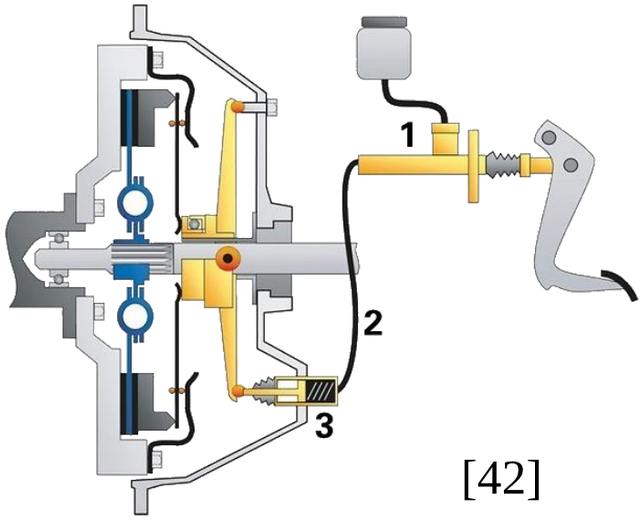


[40]

Gidravlik yuritmali



[42]



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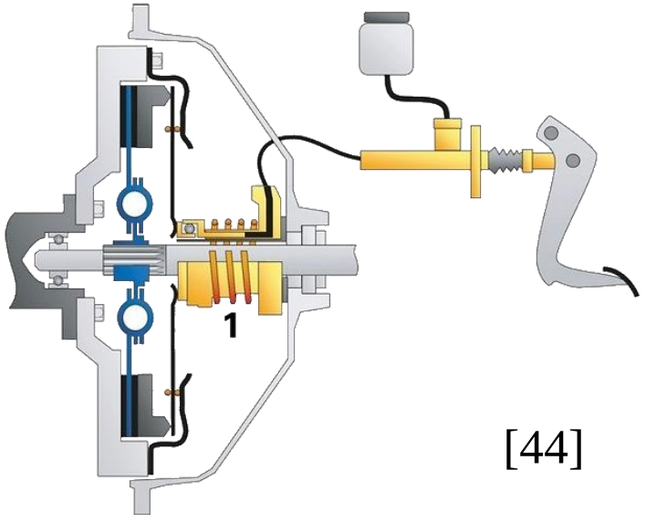


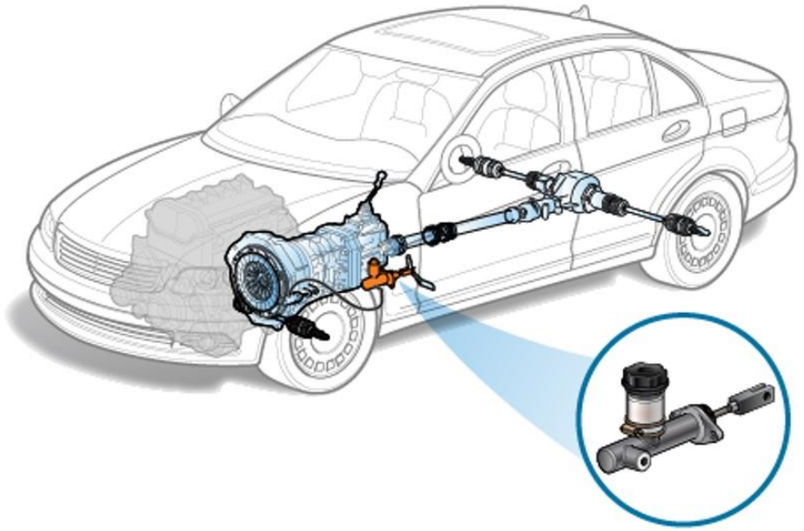
[44]

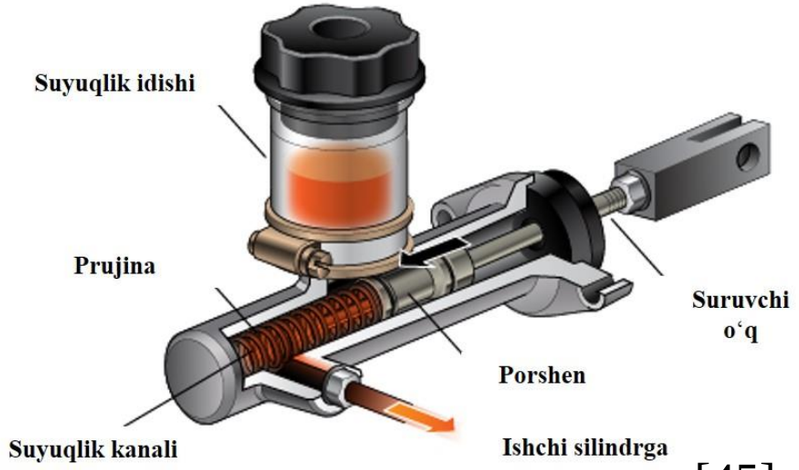
Asosiy silindr -

ilashish muftasi gidravlik yuritmasining eng muhim qismi hisoblanadi.

Uning o‘qi pedal yordamida harakatga kelib, silindrda suyuqlik bosimini hosil qiladi.

Hosil bo‘lgan suyuqlikning bosimi truba yordamida ilashish muftasining ishchi silindriga uzatiladi.



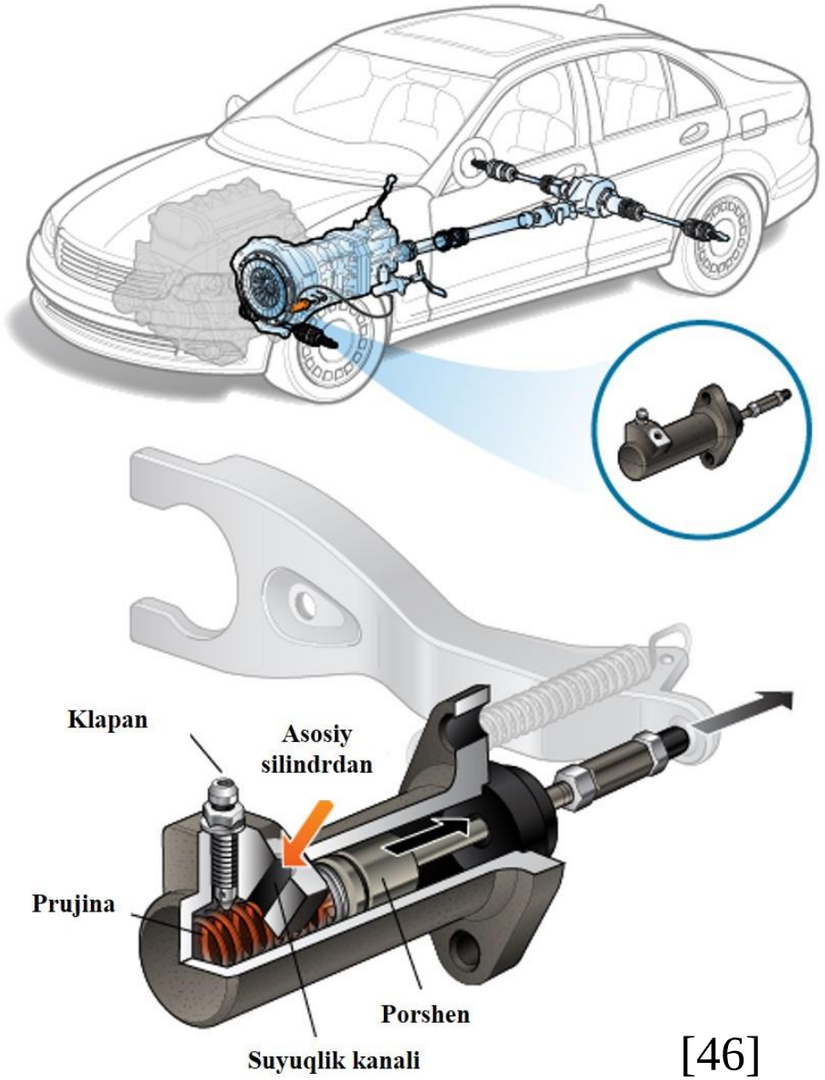


[45]

Ishchi silindr -

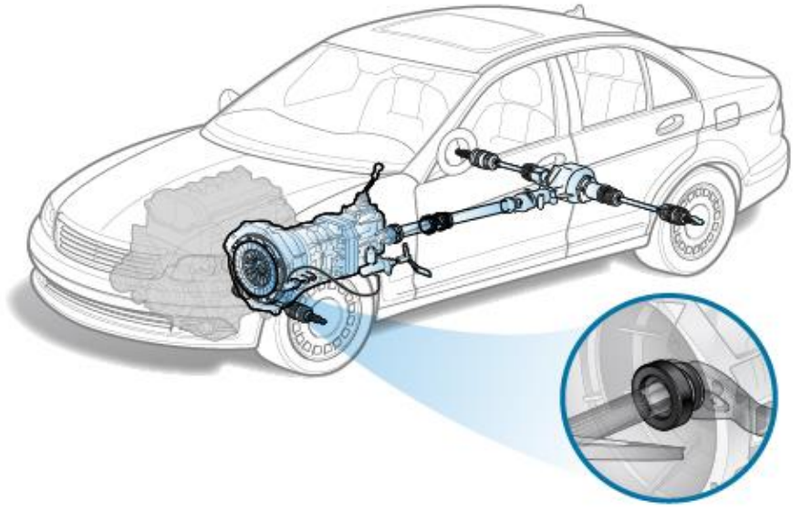
asosiy silindrdan ishlab chiqarilgan gidravlik bosimni qabul qiladi.

Natijada ajratish vilkasini turtib, siquvchi disk prujinalarini ajratish podshipnigi orqali maxovik tomon harakatlantirishi hisobiga dvigatel burovchi momentini transmissiyadan uzadi.



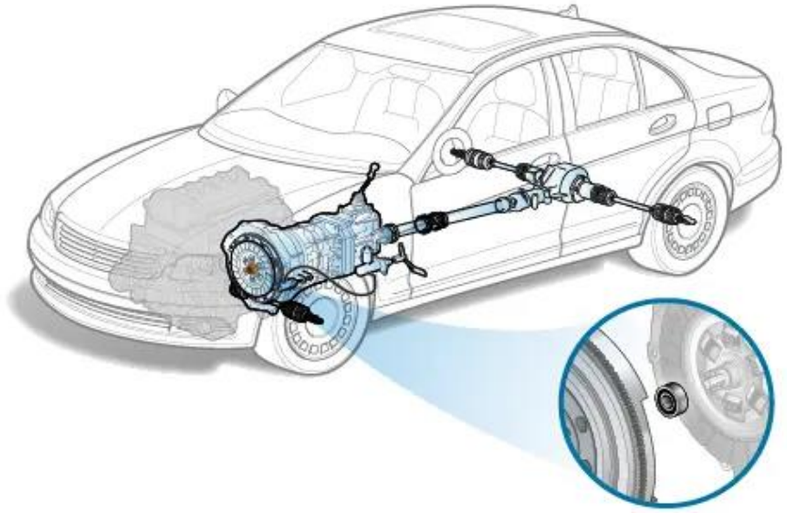
[46]

Ajratish podshipnigi

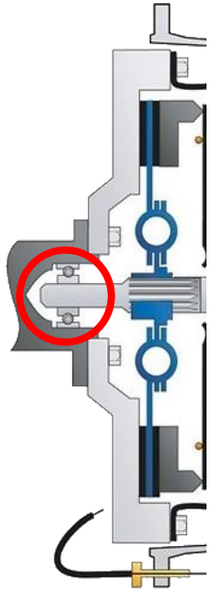


[47]

Yetakchi o‘q podshipnigi



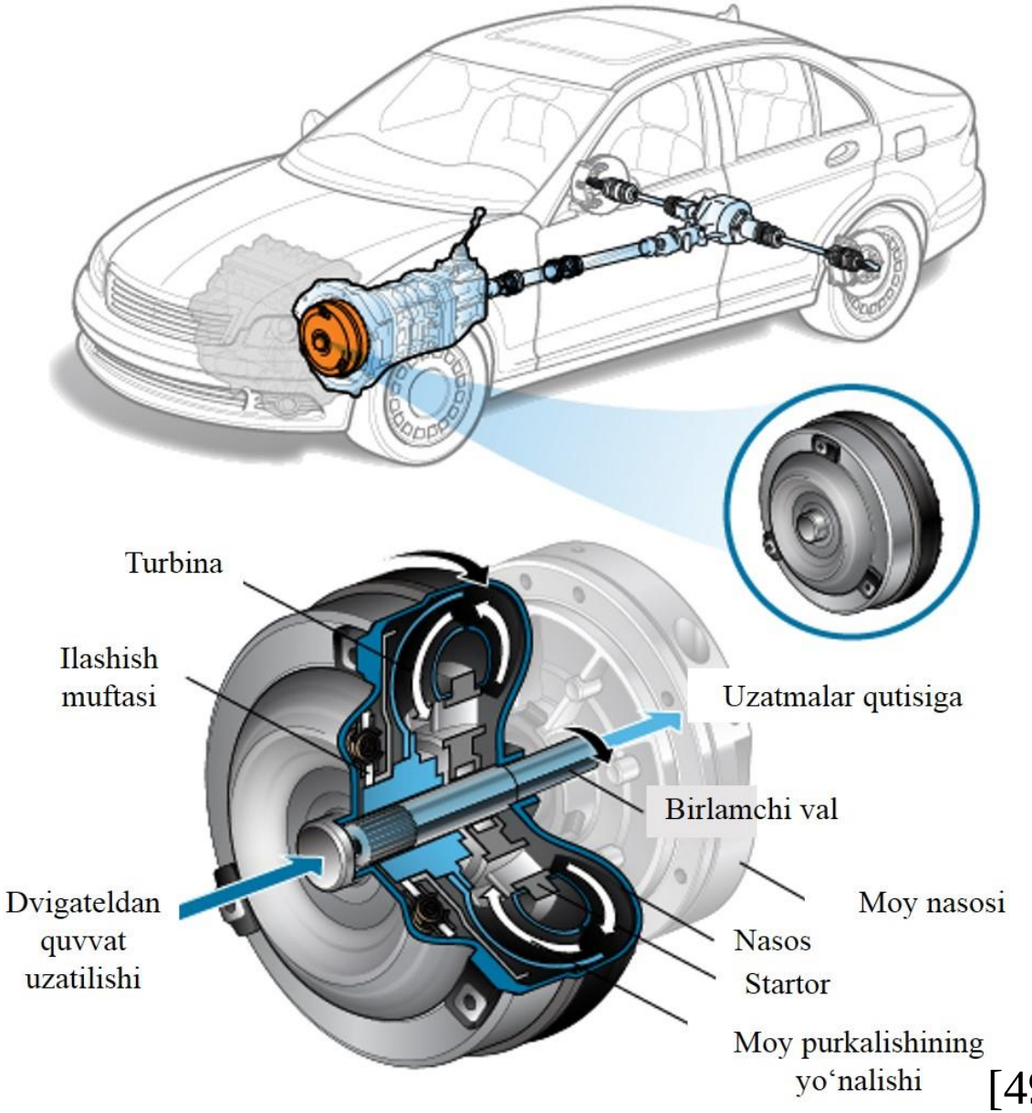
[48]



[41]

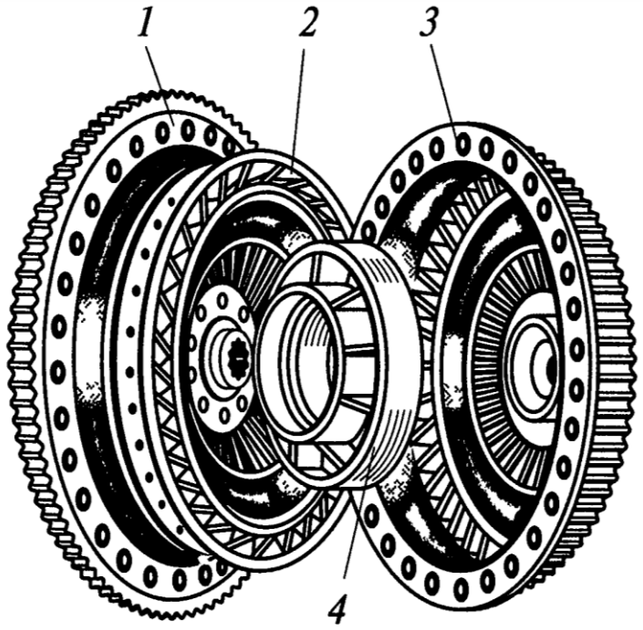
Gidravlik ilashish muftasi.

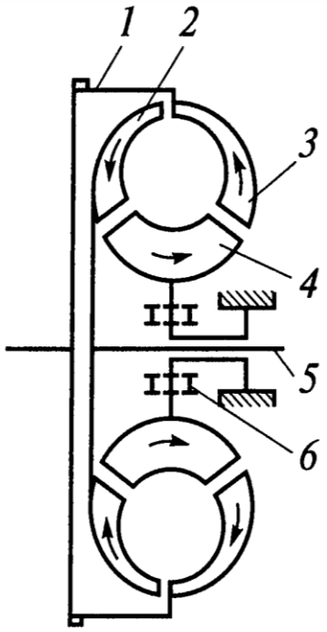
Gidromufta ilashish muftalarida yetakchi va yetaklanuvchi qismlarda bog‘lanish, shu qismlar orasida harakatlanayotgan suyuqlik oqimining bosimi bilan amalga oshiriladi.

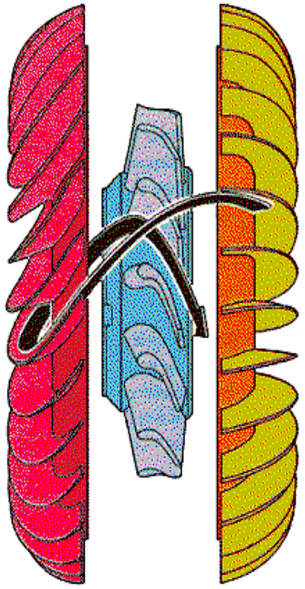


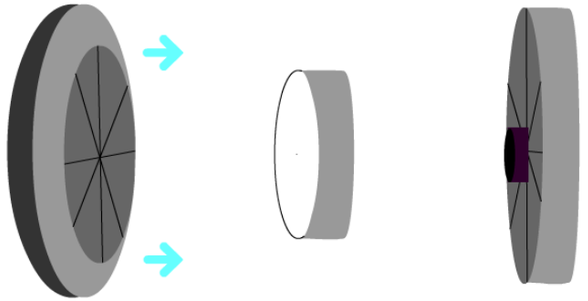
[49]

Gidrotransformator ishchi g‘ildiraklarining konstruksiyasi:







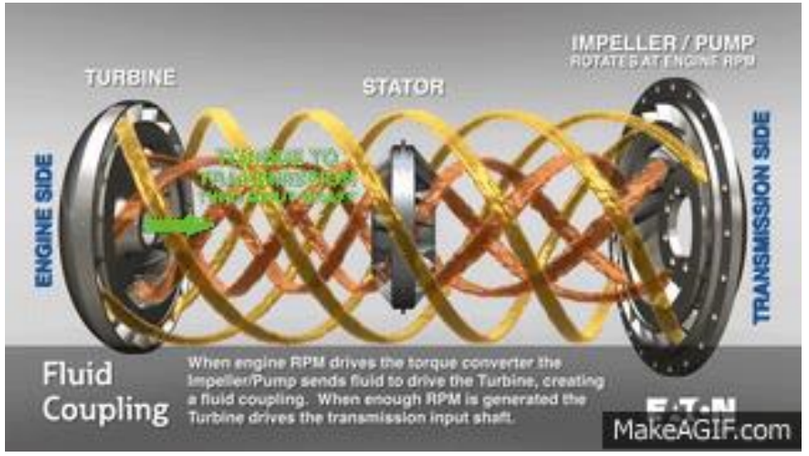


[51]

1-maxovik, 2-turbina g‘ildiragi, 3-nasos g‘ildiragi,

4-reaktor, 5-val, 6-mufta.

[50]



[52]

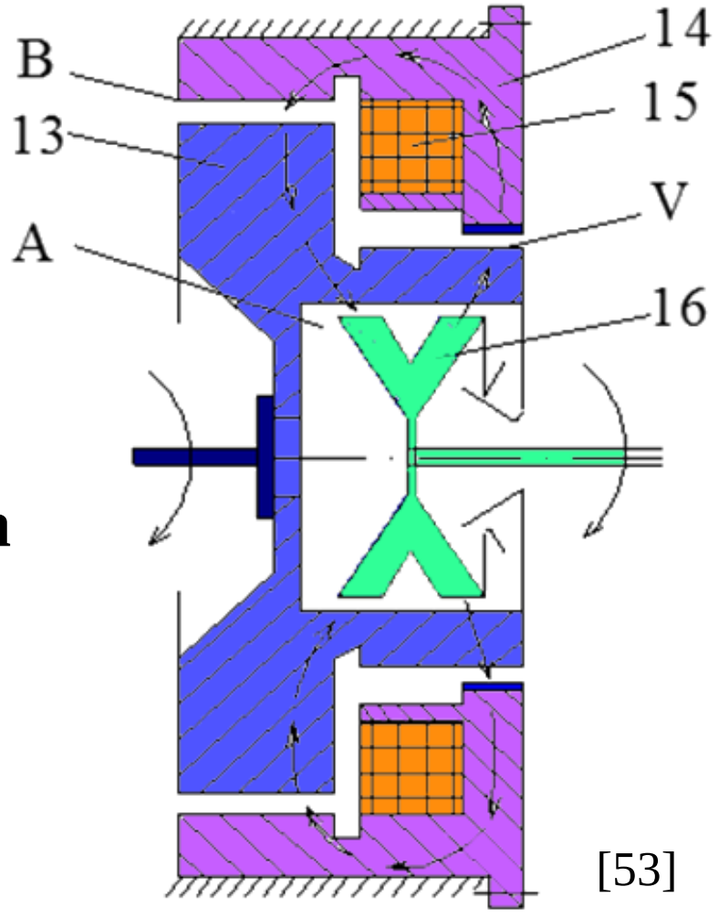
Elektromagnitli ilashish muftasi

Elektromagnit muftalarida magnit maydoni hosil qilinadi.

Elektromagnit maydoni ta’siridagi temir kukunlari yetakchi va yetaklanuvchi qismlar orasida harakat uzatiladi.

Elektromagnit kukunli ilashish muftasi uch asosiy qismga ega:

- **qo‘zg‘almas korpus bilan qo‘zg‘atish o‘rami;**
- **dvigatel tirsakli vali bilan ulangan yetakchi qism;**
- **uzatmalar qutisining yetakchi valiga burovchi momentni uzatuvchi yetaklanuvchi qism.**



[53]

13-yetakchi qism, 14-qo‘zg‘almas korpus, 15- qo‘zg‘atish o‘rami, 16-yetaklanuvchi qism.

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E'TIBORINGIZ UCHUN RAHMAT!!!