A transmission is mechanical equipment which transfers the torsion moment, changes its size or increases or decreases the rotations of a driven shaft. It can also change the sense of rotation. Mechanical transmissions are used in operating with constant gears. Car transmissions use gradual or completely changeable gearing.

Transmissions are made up of these basic parts:
1. Gearbox
2. Shafts – driving and driven
3. Bearings - antifriction or sliding
4. Gear wheel – pinion and gear wheel or gears
5. Sealing rings – they limit oil leakage

Picture 1 – A transmission with two spur gears and a shaft on a vertical plane

1 - pinion of the input shaft, 2 - gear wheel of the central shaft (layshaft), 3 - pinion of the central shaft (layshaft), 4 - gear wheel of the output shaft, 5,6 - input shaft bearings, 7,8 - central shaft bearings, 9,10 - output shaft bearings, 11 - input shaft sealing ring, 12 - output shaft sealing ring.

A transmission can have one or more gears. The number of gears depends on the method of use. This means what output rotation and output torsion moment we need. Every transmission is evaluated according to its transference number. We get this number from the speed ratio, the wheel diameter and the number of teeth of the driving and driven wheels. The transference number is expressed as a ratio – and it is non-dimensional.
A gear wheel can be connected with a shaft using these methods:
1. **non-dismantled** – the shaft is produced with a gear wheel as a machined casting. The gear wheel is pressed with an overlap on the shaft.
2. **dismantled**

A gear wheel with a shaft is made:
A) using a **sealing spring**
B) using **grooving**

The most often used gears are:
1. **spur** (see Picture 2)
2. **bevel**
3. **spiral**
4. **worm**

The types of teeth are classified according to their method of use. They can be straight, **slanted**, **backswept**, and other types.

**Picture 2 - A spur gear with straight teeth**

Geared **transmissions** transfer the **torsion moment** from the **driving shaft** to the **driven shaft** using form contact without **slippage**. The advantages are a constant **speed ratio** and a small **axial shaft** distance.

**Advantages:**
1. high **efficiency**
2. long **durability**
3. simple **maintenance**

**Disadvantages:**
1. **demanding** production
2. high costs
3. **accuracy** is **demanding**

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Literature used: 1. Části strojů – Hruška, 2. Stavba a provoz strojů – Kříž.
VOCABULARY
antifriction  valivý
axial  osový
backswept  šípovitý
bearing  ložisko
bevel  kuželový
demanding  náročný
dismantled  rozebíratelný
driven  hnaný
driving  hnací
durability  životnost
efficiency  účinnost
gear  ozubený převod, soukolí
gearing  ozubení
gearing profile  profil zubu
grooving  drážkování
layshaft  předlohový hřídel
non-dimensional  bezrozměrný
non-dismantled  nerozebíratelný
oil leakage  únik oleje
sealing ring  těsnící kroužek
shaft  hřídel
slanted  šikmý
sliding  kluzný
slippage  skluz
speed ratio  poměr otáček
spiral  šroubový
spring  pero
spur  čelní
torsion moment  kroutící moment
transference  převodový
transmission  převodovka
worm  šnekový

COMPREHENSION QUESTIONS
1. What is a transmission?
2. What parts is a transmission made up of?
3. Can you name the most often used gears?
4. What does a geared transmission transfer?
1. **Criss Cross Puzzle** - 14 words were placed into the puzzle.

**Across**
5. převodovka
7. přesnost
9. drážkování
10. kolo
11. náročný
13. hřídel

**Down**
1. účinnost
2. měnitelný
3. přímý
4. pastorek
6. osový
8. hnaný
10. šnekový
12. ozubení

2. Read the definitions and supply the words from the box:

<table>
<thead>
<tr>
<th>word</th>
<th>definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>accuracy</td>
<td>happening slowly over a long period</td>
</tr>
<tr>
<td>durability</td>
<td>to become or to make sth greater in amount, number etc.</td>
</tr>
<tr>
<td>increase</td>
<td>a twisted piece of metal that can be pressed or pulled but which always returns to its original shape or position</td>
</tr>
<tr>
<td>gradual</td>
<td>to last for a long time without breaking</td>
</tr>
<tr>
<td>demanding</td>
<td>expecting a lot of work or attention from others</td>
</tr>
<tr>
<td>spring</td>
<td>the amount of space between two places or things</td>
</tr>
<tr>
<td>distance</td>
<td>being exact or correct</td>
</tr>
</tbody>
</table>
1. Criss Cross Puzzle

transmission převodovka
shaft hřídel
gearing ozubení
pinion pastorek
wheel kolo
changeable měnitelný
driven hnaný
axial osový
efficiency účinnost
demanding náročný
accuracy přesnost
straight přímý
grooving drážkování
worm šnekový

2. Definitions

1. happening slowly over a long period  GRADUAL
2. to become or to make sth greater in amount, number etc.  INCREASE
3. a twisted piece of metal that can be pressed or pulled but which always returns to its original shape or position  SPRING
4. to last for a long time without breaking  DURABILITY
5. expecting a lot of work or attention from others  DEMANDING
6. the amount of space between two places or things  DISTANCE
7. being exact or correct  ACCURACY