



Technical English  
Unit 41  
professional english  
**Transmission 1**

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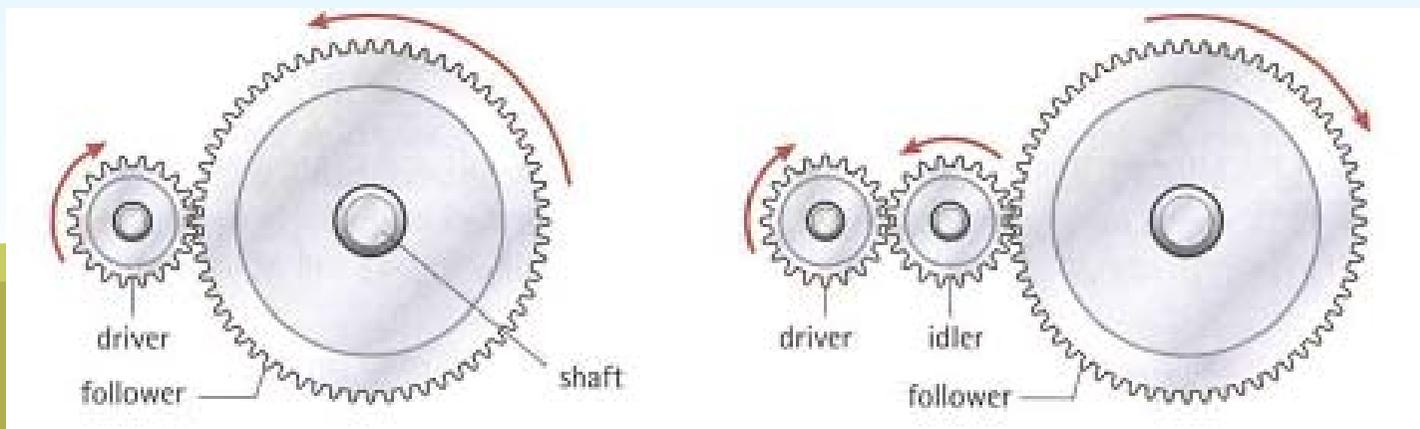


# Content

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- A. Gears
  - B. Gear ratios
  - C. Types of gear wheel

## A. Gears

**Gear wheels**, or **gears**, are wheels with **teeth** (or **cogs**). The teeth **interlock** (fit together) with those of other gear wheels. When one gear wheel revolves, the other revolves with it – in the opposite direction – as their teeth **mesh together**. Gears are normally fitted to **shafts**. They **transmit** rotary motion from one shaft to another – that is, they transmit **drive**. Drive, usually supplied by an engine or motor, causes a shaft to revolve. A shaft connected directly to an engine or motor is called a **driveshaft** – or an **input shaft**.



## A. Gears

A gear wheel on a driveshaft is called a **driver**. The second gear wheel, which **meshes with** the driver, is called a **follower** – the driver **drives** the follower.

An assembly of several shafts and gear wheels is called a **gear train** or **transmission system**. It begins with an input shaft and ends with an **output shaft**. The system may contain **idler gears** (or **idlers**). These change the direction of a follower.

## B. Gears ratios

Gears can provide a mechanical advantage (see Unit 33) by using different **gear ratios**. In the diagrams above, the driver has 20 teeth and the follower 60 teeth. Therefore the driver rotates three times to make the follower rotate once. So the gear ratio is **3:1 (Three to one)** .

This means that if, for example, the **input speed** – that is, the speed of the driver – is 3,000 rpm, the **output speed** (of the follower) will be 1,000 rpm.

## B. Gears ratios

In some machines, a **gearbox** is used to provide a number of different gear ratios. A gearbox has a **gear selection** system, which allows gears to be **changed** (or **shifted**) while the transmission is running.

This may be a **manual gearbox**, where gears are changed by a person, or an **automatic gearbox**, which automatically selects a **higher gear** or **lower gear**, as needed.

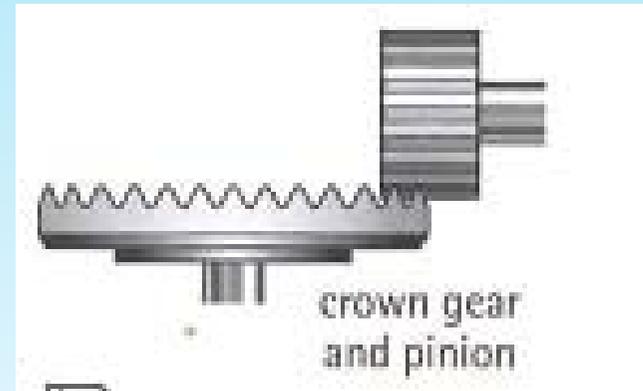
## c. Types of gear wheel

- **Spur gears** are the simplest gears. The teeth run straight across the wheel.
- **Helical gears** have curved teeth, so that they mesh together more smoothly.
- **Bevel gears** allow drive to be transmitted through an angle – often  $90^\circ$ .



## c. Types of gear wheel

- **Crown gears** transmit drive through  $90^\circ$ , often to a small gear called a pinion.
- **Worm gears** transmit drive through an angle. They also allow a low output speed relative to the input speed of the **worm**. They can provide a ‘one way’ drive, as a worm can drive a gear but a gear cannot drive a worm (the mechanism will lock).



**41.1** Change four words in the text below to make it correct. Look at A opposite to help you.

An engine is connected to a driveshaft. Fitted to this output shaft is a gear wheel called the idler. As this gear wheel turns, it drives another gear wheel alongside it called a driver, which is fitted to an input shaft.

An engine is connected to a driveshaft. Fitted to this **input** shaft is a gear wheel called the **driver**. As this gear wheel turns, it drives another gear wheel alongside it called a **follower**, which is fitted to an **output** shaft.

**41.2** Complete the text about continuously variable transmission using the words in the box. Look at A, B and C opposite to help you.

Automatic	Higher	ratio	Shafts	transmit
helical	Manual	Selection	shift	wheels

### **CONTINUOUSLY VARIABLE TRANSMISSION(CVT)**

(1) ----- gearboxes allow the driver of a vehicle to (2) ----- gears as required. If a (3) ----- gear is selected, the speed of the output shaft will increase relative to the input shaft, for a given engine speed. In a typical (4) ----- gearbox, however, the gear(5) ----- system is automated, requiring no action by the driver. In addition, most automatic transmission systems use so –called planetary gears.

1 manual 2 shift  
3 higher 4 automatic  
5 selection



The Case-IH Puma CVX tractor is equipped with continuously variable transmission.

**41.2** Complete the text about continuously variable transmission using the words in the box. Look at A, B and C opposite to help you.

Automatic	Higher	ratio	Shafts	transmit
helical	Manual	Selection	shift	wheels

## CONTINUOUSLY VARIABLE TRANSMISSION(CVT)

In basic terms, these allow the transmission to remain connected at all times - unlike manual gearboxes, in which pairs of (6) ----- gears are momentarily disconnected each time a shift is made. The principle of continuously variable transmission (CVT) is entirely different to both manual and automatic systems. Instead of having a fixed number of different gear (7) ----- , each with different numbers to teeth, CVT uses a special mechanism to continuously and progressively adjust the gear(8) ----- between the input and output (9) ----- .

- 6 helical
- 7 wheels
- 8 ratio
- 9 shafts



The Case-IH Puma CVX tractor is equipped with continuously variable transmission.

**41.2** Complete the text about continuously variable transmission using the words in the box. Look at A, B and C opposite to help you.

### CONTINUOUSLY VARIABLE TRANSMISSION(CVT)

Therefore, as the vehicle accelerates or decelerates, continual adjustments are made to the transmission automatically. This allows the engine to be maintained at a constant speed for optimum power and fuel efficiency while the system is able to be continuously (10) ----- drive to the vehicle's wheels.

10 transmit



The Case-IH Puma CVX tractor is equipped with continuously variable transmission.

**41.3** Make word combinations with gears using words from A and C opposite. Then use the word combination to complete the sentences (1-4) below. Sometimes there is more than one possible answer .

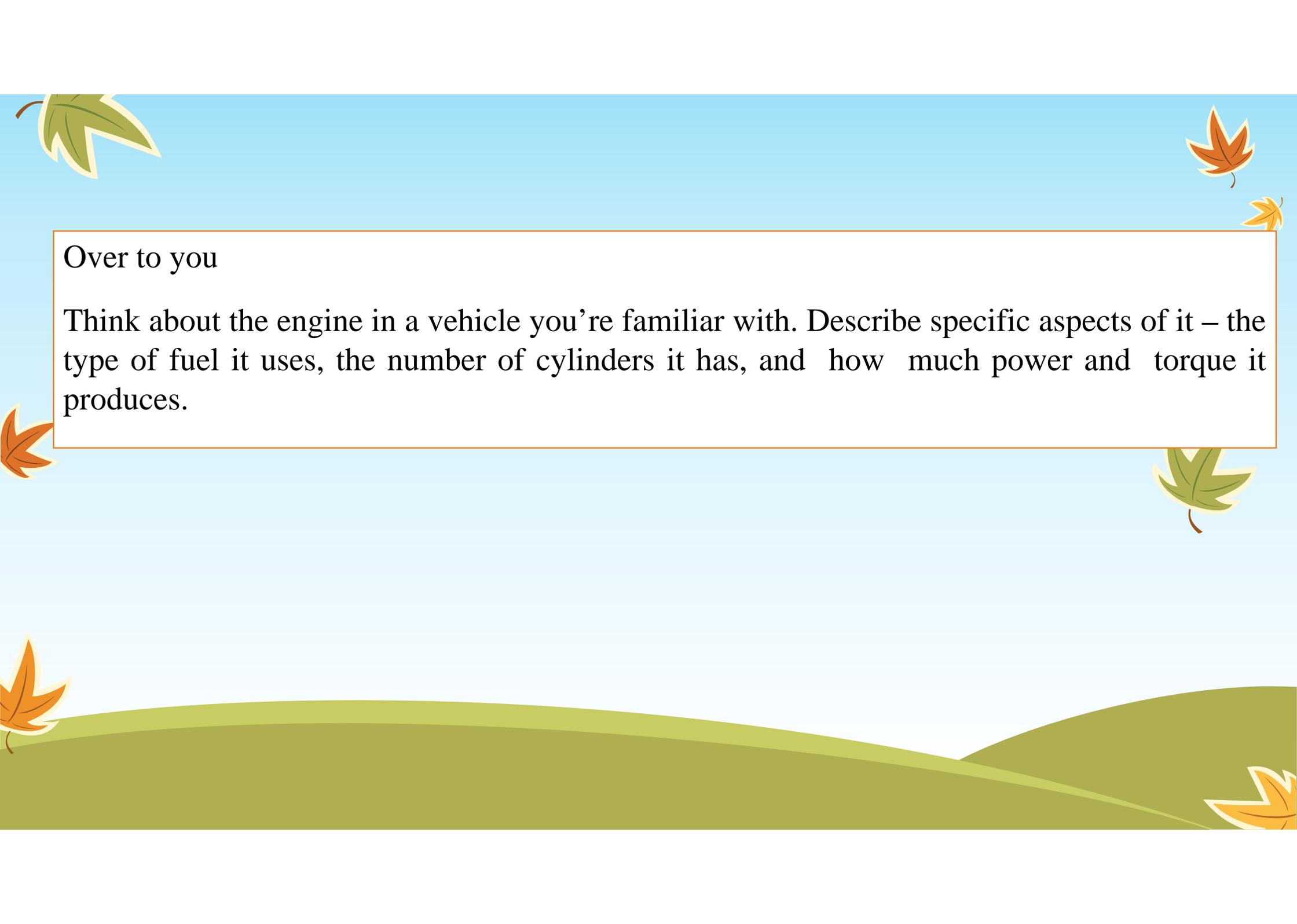
1 ----- gears are used to transmit drive through an angle.

2 ----- gears run more quietly than spur gears.

3 ----- gears can generally only transmit drive in one direction.

4 ----- gears allow drivers and followers to revolve in the same direction.

1 Bevel/Crown/Worm 3 Worm  
2 Helical 4 Idler



Over to you

Think about the engine in a vehicle you're familiar with. Describe specific aspects of it – the type of fuel it uses, the number of cylinders it has, and how much power and torque it produces.



I see you  
got right

Any Questions